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Incentivo À Integração Entre Direito E Tecnologia Através Do Método De Boaventura De Sousa Santos

By Tiago Vicente Didier & Thaís de Sá Curvelo

Resumo- Trata-se de artigo realizado com o objetivo de apresentar de forma técnica e fundamentada um incentivo à integração entre direito e tecnologia, através do método emergente sugerido por Boaventura de Sousa Santos em sua obra “Um discurso sobre as ciências”. Para fundamentar o presente trabalho serão demonstradas, à luz das idéias do autor, as características, consequências e a crise do método científico vigente, ao passo em que serão apresentadas também as características e consequências do novo modelo científico emergente sugerido por ele. Em seguida, restará constatado que os instrumentos tecnológicos evoluem de maneira rápida e revolucionária, provocando modificações diretas nas relações sociais, ao passo em que o direito evolui de forma moderada e vagarosa, admitindo alterações somente após a sedimentação da situação social incorporada. Será demonstrado que, em razão dessa diferença, a tecnologia e o direito se tornaram áreas opostas e isoladas, sendo raras as ocasiões em que ocorre integração entre ambas e que o produto dessa falta de diálogo entre as disciplinas é que o direito não acompanha as mudanças sociais advindas do avanço tecnológico. Será esposado ainda que, assim como evolui a tecnologia, é imprescindível que o direito também evolua, se adaptando à nova realidade demandada pelas relações sociais, de forma planejada e satisfatória.

Palavras-chave: boaventura de sousa santos. método científico emergente. direito. tecnologia. incentivo à integração.

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Incentivo À Integração Entre Direito E Tecnologia Através Do Método De Boaventura De Sousa Santos

Tiago Vicente Didier ^α & Thaís de Sá Curvelo ^ο

Resumo- Trata-se de artigo realizado com o objetivo de apresentar de forma técnica e fundamentada um incentivo à integração entre direito e tecnologia, através do método emergente sugerido por Boaventura de Sousa Santos em sua obra “Um discurso sobre as ciências”. Para fundamentar o presente trabalho serão demonstradas, à luz das idéias do autor, as características, conseqüências e a crise do método científico vigente, ao passo em que serão apresentadas também as características e conseqüências do novo modelo científico emergente sugerido por ele. Em seguida, restará constatado que os instrumentos tecnológicos evoluem de maneira rápida e revolucionária, provocando modificações diretas nas relações sociais, ao passo em que o direito evolui de forma moderada e vagarosa, admitindo alterações somente após a sedimentação da situação social incorporada. Será demonstrado que, em razão dessa diferença, a tecnologia e o direito se tornaram áreas opostas e isoladas, sendo raras as ocasiões em que ocorre integração entre ambas e que o produto dessa falta de diálogo entre as disciplinas é que o direito não acompanha as mudanças sociais advindas do avanço tecnológico. Será esposado ainda que, assim como evolui a tecnologia, é imprescindível que o direito também evolua, se adaptando à nova realidade demandada pelas relações sociais, de forma planejada e satisfatória. Ao cabo, concluir-se-á que, para que a interface necessária entre direito e tecnologia ocorra, é imprescindível que ocorra a conscientização e participação da sociedade jurídica e que a capacidade da tecnologia influenciar e ser incorporada ao direito vai variar, portanto, com a cultura jurídica vigente.

Palavras-chave: boaventura de sousa santos. método científico emergente. direito. tecnologia. incentivo à integração.

I. INTRODUÇÃO

Dentre os fatores que mais transformam as relações sociais, está a tecnologia, que evolui de maneira rápida e revolucionária, provocando modificações diretas nas relações sociais. De forma totalmente oposta, o direito evolui de forma moderada e vagarosa, admitindo alterações somente após a sedimentação da situação social incorporada.

Em razão dessa diferença, a tecnologia e o direito se tornaram áreas opostas e isoladas, sendo raras as ocasiões em que ocorre integração entre ambas. O produto dessa falta de diálogo entre as disciplinas é que o direito não acompanha as

mudanças sociais advindas do avanço tecnológico. Quando o direito ignora as transformações sociais trazidas pela tecnologia, acaba inexoravelmente criando um distanciamento entre si e a realidade social, gerando insegurança jurídica, injustiça e desigualdade.

Para evitar esse isolamento estabelecido hoje, propõe-se a partir do presente trabalho, um incentivo à interação entre direito e tecnologia, fundamentado de forma técnica através do método emergente sugerido por Boaventura de Sousa Santos em sua obra “Um discurso sobre as ciências”.

II. MÉTODO DE BOAVENTURA DE SOUSA SANTOS

Nascido em 15 de novembro de 1940, em Coimbra, Portugal, Boaventura de Sousa Santos se tornou um dos maiores pensadores dos séculos XX e XXI. Devido a sua múltipla formação, é difícil enquadrá-lo em uma área profissional apenas. Somente a título exemplificativo, considere-se que Sousa Santos se licenciou em direito pela Universidade de Coimbra, estudou filosofia na Universidade de Berlim, fundou a Faculdade de Economia em sua cidade natal e criou nela, o curso de sociologia.

Com centenas de obras, traduzidas em cinco línguas diferentes, tratando sobre diversas áreas do conhecimento, a genialidade e abrangência das idéias de Boaventura de Sousa Santos são inquestionáveis.

Em que pese seu trabalho possa render dezenas de páginas em qualquer trabalho científico, o presente artigo terá como objeto de análise tão somente o método emergente sugerido por Sousa Santos em sua obra “Um discurso sobre as ciências”.

O referido livro foi publicado pela primeira vez em Portugal em 1987 e representa uma versão ampliada da palestra lecionada por Boaventura na abertura solene das aulas da Universidade de Coimbra, no ano lectivo de 1985/86.

Na obra “Um discurso sobre as ciências”, o autor descreve como o modelo científico atual está em declínio, em razão da postura excessivamente totalitária e fechada, ao passo em que propõe sua idéia de como será o próximo modelo científico emergente. Nas palavras do próprio autor, “descrevo a crise do paradigma dominante e identifico os traços

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principais do que designo como paradigma emergente”.¹

a) *As características do método científico vigente e suas consequências*

Sousa Santos inicia sua obra “Um discurso sobre as ciências” descrevendo a situação paradoxal vivida pela sociedade científica na atualidade. Nesse sentido, expõe que a produção científica vigente está perdida entre seu passado arcaico (que leva à improdutividade e ao aprisionamento) e seu futuro imponente (que assusta, mas exige adaptações imediatas).

Nas palavras do autor:

vivemos num tempo atônito que ao debruçar-se sobre si próprio descobre que os seus pés são um cruzamento de sombras, sombras que vêm do passado que ora pensamos já não sermos, ora pensamos não termos ainda deixado de ser, sombras que vêm do futuro que ora pensamos já sermos, ora pensamos nunca virmos a ser. (...) é possível dizer que em termos científicos vivemos ainda no século XIX e que o século XX ainda não começou (...) as potencialidades da tradução tecnológica dos conhecimentos acumulados fazem-nos crer no limiar de uma sociedade de comunicação e interactiva libertada das carências e inseguranças que ainda hoje compõem os dias de muitos de nós.²

Segundo Boaventura, uma das principais características do método científico atual é a sua postura fechada. Nesse sentido, o autor demonstra que o modelo de produção científica vigente hoje não admite integrações com outros setores do conhecimento, construindo barreiras para evitar essa interface. Nas palavras do próprio autor, o método científico atual se caracteriza por ser:

um modelo global de racionalidade científica que admite variedade interna mas que se distingue e defende, por via de fronteiras ostensivas e ostensivamente policiadas, de duas formas de conhecimento não científico (e, portanto, irracional) potencialmente perturbadoras e intrusas: o senso comum e as chamadas humanidades ou estudos humanísticos.³

Essa postura hermética do modelo científico atual não existe apenas com relação aos outros setores do conhecimento, mas também dentro das próprias

áreas da ciência. Essa tendência se traduziu no alto grau de especialização existente dentro dos setores científicos, que é outra marca do modelo vigente. Nesse sentido, a produção científica atual se caracteriza pelo seu alto grau de setorização e especialização, de modo que o pesquisador moderno possui um conhecimento grande, porém sobre assuntos altamente limitados. Sobre o tema, Santos aponta que:

na ciência moderna o conhecimento avança pela especialização. O conhecimento é tanto mais rigoroso quanto mais restrito é o objecto sobre que incide. Nisso reside, aliás, o que hoje se reconhece ser o dilema básico da ciência moderna: o seu rigor aumenta na proporção directa da arbitrariedade com que espartilha o real. Sendo um conhecimento disciplinar, tende a ser um conhecimento disciplinado, isto é, segrega uma organização do saber orientada para policiar as fronteiras entre as disciplinas e reprimir os que as quiserem transpor. É hoje reconhecido que a excessiva parcelização e disciplinarização do saber científico faz do cientista um ignorante especializado e que isso acarreta efeitos negativos.⁴

Dentre as consequências trazidas por esse afã em se manter alheio às influências externas, a ciência passou a buscar cada vez mais a regulação e a estabilidade. Desse modo, o método científico se tornou reduzido, isolado e quase estático. Conforme leciona Boaventura:

um conhecimento baseado na formulação de leis tem como pressuposto metateórico a ideia de ordem e de estabilidade do mundo, a ideia de que o passado se repete no futuro. (...) um mundo estático e eterno a flutuar num espaço vazio (...) o reduzir os factos sociais às suas dimensões externas, observáveis e mensuráveis. (...) essa redução nem sempre é fácil e nem sempre se consegue sem distorcer grosseiramente os factos ou sem os reduzir à quase irrelevância (...)⁵

A última característica do método científico vigente que o autor apresenta é seu caráter totalitário, vez que rejeita as outras formas de conhecimento, considerando a si próprio como único e verdadeiro meio de produção do conhecimento legítimo.

Segundo Sousa Santos, portanto, o método científico possui viés fechado, setORIZADO, reducionista, isolado e totalitário. Para ele, essas características se refletem na mentalidade dos próprios cientistas que adotam esse modelo. Senão veja-se.

¹ SANTOS, Boaventura de Sousa. *Um discurso sobre as ciências*. 5ª ed. São Paulo: Cortez Editora, 2008. p 10.

² SANTOS, Boaventura de Sousa. *Um discurso sobre as ciências*. 5ª ed. São Paulo: Cortez Editora, 2008, p 13/14.

³ Ibidem. p 21.

⁴ SANTOS, Boaventura de Sousa. *Um discurso sobre as ciências*. 5ª ed. São Paulo: Cortez Editora, 2008. p 73/74

⁵ Ibidem. p 30/35.

Esta preocupação em testemunhar uma ruptura fundante que possibilita uma e só uma forma de conhecimento verdadeiro está bem patente na atitude mental dos protagonistas, no seu espanto perante as próprias descobertas e a extrema e ao mesmo tempo serena arrogância com que se medem com os seus contemporâneos.⁶

Boaventura prossegue descrevendo expressamente as consequências negativas advindas do viés fechado, setorizado, reducionista, isolado e totalitário do método científico vigente. Para ele, a qualidade do conhecimento advindo da ideologia científica atual é ruim, dando ao cientista apenas uma visão limitada e limitadora dos objetos pesquisados, que são cada vez mais plurais e complexos. Para ele

o conhecimento ganha em rigor o que perde em riqueza (...) Os limites deste tipo de conhecimento são, assim, qualitativos, não são superáveis com maiores quantidades de investigação ou maior precisão dos instrumentos. Aliás, a própria precisão *quantitativa do conhecimento é estruturalmente limitada*. (...) se é verdade que o conhecimento só sabe avançar pela via da progressiva parcelização do objecto, bem representada nas crescentes especializações da ciência, é exactamente por essa via que melhor se confirma a irredutibilidade das totalidades orgânicas ou inorgânicas às partes que as constituem e, portanto, o carácter distorcivo do conhecimento centrado na observação destas últimas. Os factos observados têm vindo a escapar ao regime de isolamento prisional a que a ciência os sujeita. Os objectos têm fronteiras cada vez menos definidas; são constituídos por anéis que se entrecruzam em teias complexas com os dos restantes objectos, a tal ponto que os objectos em si são menos reais que as relações entre eles.⁷

Essas consequências negativas não se limitam a afetar somente o cientistas, mas toda a sociedade. Nesse sentido, Santos resume que “a ciência moderna produz conhecimentos e desconhecimentos. Se faz do cientista um ignorante especializado faz do cidadão comum um ignorante generalizado.”⁸

Em razão do viés fechado, setorizado, reducionista, isolado e totalitário e das consequências negativas dele advindas, Santos afirma que o método científico vigente atravessa uma profunda crise. Para ele, essa crise atinge todos os setores da ciência e é irreversível. Destarte, ele propõe que o modelo antigo seja deixado de lado e que se busque um novo, mais adequado e capaz de atender as atuais necessidades do conhecimento.

b) *As características do método emergente e suas consequências*

Boaventura de Sousa Santos prossegue sua obra “Um discurso sobre as ciências”, expondo sua idéia de como será o próximo método científico emergente. Para tanto, leva em consideração as características que engendraram a crise do modelo atual e propõe que o novo sistema emergente terá características contrapostas.

Nesse sentido, ao revés de um método fechado, setorizado, reducionista, isolado e totalitário (como o atual), Boaventura propõe que o modelo emergente será aberto ao diálogo, multidisciplinar, abrangente e tolerante. A seguir, em seus próprios termos.

com vista à obtenção de um conhecimento intersubjectivo, descritivo e compreensivo, em vez de um conhecimento objectivo, explicativo e nomotético. (...) de vocação anti-positivista, caldeada numa tradição filosófica complexa, fenomenológica, interaccionista, mito-simbólica, hermenêutica, existencialista, pragmática, reivindicando a especificidade do estudo da sociedade.

(...) É pois necessário descobrir categorias de inteligibilidade globais, conceitos quentes que derretam as fronteiras em que a ciência moderna dividiu e encerrou a realidade. (...) o mundo é comunicação e por isso a lógica existencial da ciência pós-moderna é promover a “situação comunicativa”.⁹

Para Sousa Santos, somente um método com essas características é capaz de lidar adequadamente com a complexidade dos objetos pesquisados. Ao contrário do método vigente, que evolui com a redução do objeto pesquisado, o método emergente avança na medida em que o objeto é visto de forma mais abrangente. Veja-se.

Um conhecimento deste tipo é relativamente imetódico, constitui-se a partir de uma pluralidade metodológica. Cada método é uma linguagem e a realidade responde na língua em que é perguntada. Só uma constelação de métodos pode captar o silêncio que persiste entre cada língua que pergunta. Numa fase de revolução científica como a que atravessamos, essa pluralidade de métodos só é possível mediante transgressão metodológica. Sendo certo que cada método só esclarece o que lhe convém e quando esclarece fá-lo sem surpresas de maior, a inovação científica consiste em inventar contextos persuasivos que conduzam à aplicação dos métodos fora do seu habitat natural.¹⁰

⁶ Ibidem. p 22.

⁷ SANTOS, Boaventura de Sousa. *Um discurso sobre as ciências*. 5ª ed. São Paulo: Cortez Editora, 2008. p 53/56.

⁸ Ibidem. p 88.

⁹ SANTOS, Boaventura de Sousa. *Um discurso sobre as ciências*. 5ª ed. São Paulo: Cortez Editora, 2008. p 38/39, 68/69, 72/73.

¹⁰ Ibidem. p 77/78.

Ainda tratando sobre as características do novo método emergente, Boaventura é enfático ao afirmar que, diferentemente do sistema vigente, o novo modelo científico emergente deve estar atento à realidade social. Para ele, “a análise das condições sociais, dos contextos culturais, dos modelos organizacionais da investigação científica, antes acantonada no campo separado e estanque da sociologia da ciência, passou a ocupar papel de relevo na reflexão epistemológica.”.¹¹

Somente um modelo científico plural, abrangente e voltado à realidade social é capaz de “captar a profundidade horizontal das relações conscientes entre pessoas e entre pessoas e coisas.”.¹²

Ao adotar um método aberto ao diálogo, multidisciplinar, abrangente, tolerante e atento à realidade social, o cientista será capaz de produzir o conhecimento que Sousa Santos chama de local e total. O conhecimento é local, porque consegue captar e se adequar ao contexto social em que foi produzido. Por sua vez, o conhecimento também é total, porque é bem sucedido em lidar com a complexidade dos objetos pesquisados.

III. INCENTIVO À INTEGRAÇÃO ENTRE DIREITO E TECNOLOGIA

A sociabilidade é uma característica da essência humana. Por isso, a convivência em sociedade é a maneira natural de existência da espécie. Em idos do século XVII, o poeta britânico John Donne já dizia que “no man is an island, entire of itself; every man is a piece of the continent, a part of the main”.¹³

Em que pese seja algo intrínseco à natureza do homem, a convivência em sociedade não é algo simples ou fácil. Por isso, todo agrupamento social humano, não importa seu grau de civilização, possui regras internas destinadas a regular a convivência em grupo.

Nesse contexto, o direito surge como ferramenta destinada a regular e possibilitar a convivência social da espécie humana. Conforme preleciona Vicente Ráo:

é o direito um sistema de disciplina social fundado na natureza humana que, estabelecendo nas relações entre os homens uma proporção de reciprocidade nos poderes e deveres que lhes atribui, regula as condições existenciais dos indivíduos e dos grupos sociais e, em consequência, da sociedade.¹⁴

Sendo assim, o direito pode ser conceituado como o conjunto de instrumentos destinados a regular as relações humanas interpessoais, que são a própria razão de existir do direito, de modo que *ubi jus ubi societas* (onde há direito, há sociedade).

A relações interpessoais estabelecidas em determinada sociedade constituem, portanto, o ponto de partida do direito. Dessa forma, modificando-se a maneira como as relações interpessoais acontecem, modifica-se, por consequência, o próprio direito posto na sociedade. Nesse sentido é o parecer de Ada Pellegrini Grinover.

E a resposta está na função que o direito exerce na sociedade: a função ordenadora, isto é, de coordenação dos interesses que se manifestam na vida social, de modo a organizar a cooperação entre as pessoas e compor os conflitos que se verificam entre os seus membros.

A tarefa da ordem jurídica é exatamente a de harmonizar as relações sociais intersubjetivas, a fim de ensejar a máxima realização dos valores humanos com o mínimo de sacrifício e desgaste.¹⁵

Dentre os fatores que mais transformam as relações sociais, está a tecnologia. Esta pode ser definida de forma ampla como o “conjunto de conhecimentos e informações organizados, provenientes de fontes diversas como descobertas científicas e invenções, obtidos através de diferentes métodos e utilizados na produção de bens e serviços”.¹⁶

Para fins de utilização no presente trabalho, será tomado como referência o conceito mais restrito e usual de tecnologia, que é o conceito instrumentalista. Segundo esta concepção mais objetiva, enxerga-se a tecnologia tal qual uma sinédoque, em que o todo é reduzido às partes, ou nesse caso, às “ferramentas ou artefatos construídos para uma diversidade de tarefas”.¹⁷

Utilizando o conceito instrumentalista, portanto, a tecnologia se faz representar nos dias atuais, principalmente pelos *smartphones*, computadores, *gadgets*, aplicativos, *devices*, redes sociais, dentre outros.

Não é preciso ser um conhecedor do tema para perceber que os instrumentos tecnológicos evoluem de forma assustadoramente rápida e intensa. Com isso, se quer dizer que os avanços nessa área

¹⁵ GRINOVER, Ada Pellegrini et al. *Teoria geral do processo*. 26ª ed. São Paulo: Malheiros, 2010. p. 25.

¹⁶ CORRÊIA, Maira Baumgarten. Tecnologia. Inc: CATTANI, Antonio D. (Org.). *Trabalho e tecnologia: dicionário crítico*. Petrópolis: Vozes: Editora da Universidade/UFRS, 1999, p.250.

¹⁷ VERASZTO, Estéfano Vizconde et al. *Tecnologia: Buscando uma definição para o conceito*. Disponível em: <<http://ojs.letras.up.pt/ojs/index.php/prismacom/article/viewFile/2078/1913>>. Acesso em: 09 ago. 2015. p.68.

¹¹ Ibidem. p 50/51.

¹² Ibidem. p 89/90.

¹³ DONNE, John. *John Donnes Devotions*. Grand Rapids: Christian Classics Ethereal Library. p. 135. “nenhum homem é uma ilha, inteiro em si mesmo, todo homem é uma parte do continente, uma parte da terra” (Tradução do Autor).

¹⁴ RÁO, Vicente. *O direito e a vida dos direitos*. 3 ed. São Paulo: Revista dos Tribunais, 1991. p. 31.

acontecem não só aceleradamente, mas também de forma revolucionária. Destarte, o que é tendência e novidade atualmente, em questão de meses, pode se tornar ultrapassado e cair em desuso.

Nesse sentido, Eudes de Oliveira Júnior preleciona que “a evolução é tão gigantesca e até mesmo desproporcional com a realidade do próprio mundo que de um ano para outro as transformações são significativas”.¹⁸

Além dessa capacidade de evolução rápida e intensa, a tecnologia tem o poder de dominar as diretrizes das relações sociais. Cada novo utensílio tecnológico que surge causa modificações diretas na forma como as interações humanas acontecem. Nas palavras de Abhner Arabi:

nota-se quão profundas podem ser as modificações acarretadas pelo desenvolvimento tecnológico em um corpo social.(...) De fato, ao revelar novas necessidades e novos padrões de comportamentos humanos, a constante evolução tecnológica cria utilidades com velocidade exponencial, a desafiar o quadro normativo existente, face à evolução da complexidade da sociedade.¹⁹

De maneira diametralmente oposta à tecnologia, evolui o direito. Não se está a afirmar que o direito seja estático, entretanto, é inegável que sua evolução acontece de forma tímida e vagarosa. Ou seja, nas raras ocasiões em que o direito avança, ele o faz de forma moderada.

Ademais, constantemente as modificações ocorridas no direito servem tão somente para incorporar algum fato social já profundamente consolidado. Nas palavras de Alexandre Krammes, “qualquer que seja a forma de estruturação do Direito aplicado, o importante é notar que sua evolução é lenta e gradual, sendo que na maioria das vezes ocorre após um clamor social ou a formação de uma nova conjuntura política.”.²⁰

Resumindo, a tecnologia evolui de maneira rápida e revolucionária, provocando modificações diretas nas relações sociais. De forma totalmente oposta, o direito evolui de forma moderada e vagarosa, admitindo alterações somente após a sedimentação da situação social incorporada.

Em razão dessa diferença, a tecnologia e o direito se tornaram áreas opostas e isoladas, sendo

raras as ocasiões em que ocorre integração entre ambas. Ainda nas palavras de Krammes:

Direito e tecnologia são áreas da ciência que, em um contexto histórico, pouca influência ou governabilidade tiveram um sobre o outro. O primeiro foi desenvolvido e solidificado há mais tempo, sendo pouco propenso a mudanças em sua forma. O outro, por sua vez, tem por característica básica a mutação, o que o torna essencialmente dinâmico.²¹

O produto dessa falta de diálogo entre as disciplinas é que o direito não acompanha as mudanças sociais advindas do avanço tecnológico. Assim como Boaventura de Sousa Santos ensina que o método científico atual é fechado e que não admite integrações com outros setores do conhecimento, ousa-se aqui afirmar que o direito também aparenta ter essa mesma intenção de se manter alheio às inovações trazidas pela tecnologia, admitindo-as, tão somente quando não há mais como ignorá-las. Nesse mesmo sentido é o parecer de Eudes de Oliveira Júnior.

O Direito, no entanto, faz seu caminhar paralelo e solitário, de forma lenta, sem atropelos e de quando em quando lança um olhar sobre as novas conquistas tecnológicas, que ainda não fazem parte de seu arsenal legislativo, e fica aguardando manifestações a respeito da nova revolução que se apresenta e desafia as necessidades da sociedade.²²

Alhures, viu-se que Boaventura descreve expressamente as consequências negativas advindas do viés fechado e isolado do método científico vigente. Para ele, a qualidade do conhecimento advindo do modelo científico atual é ruim, dando ao cientista apenas uma visão limitada e limitadora dos objetos pesquisados, que são cada vez mais plurais e complexos. De forma resumida, ele afirma que “a ciência moderna produz conhecimentos e desconhecimentos. Se faz do cientista um ignorante especializado faz do cidadão comum um ignorante generalizado.”²³

De forma análoga, as consequências do distanciamento entre o direito e a tecnologia também são trágicas. Quando o direito ignora as transformações sociais trazidas pela tecnologia, acaba inexoravelmente criando um distanciamento entre si e a realidade social. Ora, naturalmente que o ordenamento

¹⁸ OLIVEIRA JÚNIOR, Eudes Quintino de. *O Direito e a tecnologia*. Disponível em: <<http://www.migalhas.com.br/dePeso/16,MI257699,510450+Direito+e+a+tecnologia>>. Acesso em 08 ago.2017.

¹⁹ ARABI, Abhner Youssif Mota. *Direito e tecnologia: relação cada vez mais necessária*. Disponível em: <<https://jota.info/artigos/direito-e-tecnologia-relacao-cada-vez-mais-necessaria-04012017>>. Acesso em 08 ago.2017.

²⁰ KRAMES, Alexandre Golin; CARDOSO, Marcelo Herondino. *Sistemas Jurídicos e Tecnologia: evolução e influências*. Disponível em: <<http://www.egov.ufsc.br/portal/sites/default/files/anexos/29603-29619-1PB.pdf>>. Acesso em 10 ago. 2017.

²¹ Ibidem.

²² OLIVEIRA JÚNIOR, Eudes Quintino de. *O Direito e a tecnologia*. Disponível em: <<http://www.migalhas.com.br/dePeso/16,MI257699,510450+Direito+e+a+tecnologia>>. Acesso em 08 ago.2017.

²³ SANTOS, Boaventura de Sousa. *Um discurso sobre as ciências*. 5ª ed. São Paulo: Cortez Editora, 2008. p 88.

jurídico não pode se afastar realidade social que pretende regular, sob pena de gerar insegurança jurídica, injustiça e desigualdade. Conforme preleciona Arabi:

com efeito, a análise jurídica tradicional e isolada é incompleta quando não abrange as influências externas (sociais, econômicas, políticas etc.) dentro do contexto de suas transformações tecnológicas, que podem afetar o comportamento humano em geral e desenvolver aspectos importantes de um corpo social.²⁴

Mesmo nas oportunidades em que o direito não mais pode ignorar e acaba forçado a incorporar uma transformação social trazida pela tecnologia, constantemente o faz de forma insatisfatória ou anacrônica. Significa dizer que, finalmente quando o ordenamento jurídico é forçado a encarar os avanços tecnológicos, geralmente acaba fazendo de forma errada ou regulando tecnologias que não estão mais em uso. Confira-se o testemunho de Krammes.

Os primeiros registros do uso efetivo de recursos tecnológicos no Direito dão conta apenas do armazenamento de informações acerca de partes e processos para posterior consulta. E por muito tempo foi assim, certamente pouco para o imenso potencial que a tecnologia já tinha a oferecer. (...) Apenas para mensurar de forma parcial a demora com que o direito recebe a tecnologia para melhorar seus processos vale mencionar que tramita no congresso desde 2001 o projeto de lei n. 5.828, que regulamenta o funcionamento dos processos judiciais de forma eletrônica.²⁵

Conforme ressaltado, o direito caracteriza-se como o conjunto de instrumentos destinados a regular as relações humanas interpessoais em determinada sociedade. Dessa forma, modificando-se a maneira como as relações interpessoais acontecem, deve-se modificar por consequência o próprio ordenamento jurídico posto.

De forma simplificada, portanto, a tecnologia avança de forma rápida e revolucionária, provocando modificações diretas nas relações sociais, que por sua vez demandam adaptações no sistema jurídico vigente, que precisa se adequar. Esse é o ensinamento de Abhner Arabi.

Em razão desse irrefreável desenvolvimento tecnológico, faz-se necessário uma análise da adequação das normas jurídicas existentes à nova realidade trazida pelo seu avanço, providência a ser empreendida em diversas áreas do Direito e da formulação de políticas públicas. (...) as transformações sociais, políticas e econômicas pelas quais passa uma sociedade acarretam implicações nas relações jurídicas, mediante um processo de irritação mútua que ocasiona a resignificação e a complementação do sentido do Direito, a partir do qual se desenvolvem novos códigos que lhe permitem, a um só tempo, integrar-se e distinguir-se do meio externo, aperfeiçoando sua operacionalidade. Entre esses elementos que ensejam alterações recíprocas entre as relações jurídicas, econômicas e a formulação de políticas públicas, papel de destaque tem o impacto do contínuo desenvolvimento de tecnologias contemporâneas.²⁶

Ao revés de um método científico fechado e isolado (como o atual), viu-se que Sousa Santos propõe que o novo modelo emergente deverá ser aberto ao diálogo, multidisciplinar e voltado à realidade social. Para ele, somente uma mentalidade científica com essas características é capaz de lidar adequadamente com a complexidade dos objetos pesquisados e “captar a profundidade horizontal das relações conscientes entre pessoas e entre pessoas e coisas.”²⁷

De forma análoga, assim como evolui a tecnologia, é imprescindível que o direito também evolua, se adaptando à nova realidade demandada pelas relações sociais. E não basta que o faça somente de forma forçada, indevida ou anacrônica, mas ao revés, que essa incorporação da tecnologia ao direito ocorra de forma planejada e satisfatória. Novamente invoca-se Abhner Arabi.

Relação que Direito e Tecnologia mantém entre si (além de suas consequências sociais e econômicas a serem regulamentadas por políticas públicas), revelam a necessidade imperiosa de desenvolvimento de teorias que considerem as suas implicações mútuas e possibilitem uma compreensão mais adequada da complexidade da sociedade, bem como da formulação dos meios de

²⁴ ARABI, Abhner Youssif Mota. *Direito e tecnologia: relação cada vez mais necessária*. Disponível em: <<https://jota.info/artigos/direito-e-tecnologia-relacao-cada-vez-mais-necessaria-04012017>>. Acesso em 08 ago.2017.

²⁵ KRAMMES, Alexandre Golin; CARDOSO, Marcelo Herondino. *Sistemas Jurídicos e Tecnologia: evolução e influências*. Disponível em: <<http://www.egov.ufsc.br/portal/sites/default/files/anexos/29603-29619-1PB.pdf>>. Acesso em 10 ago. 2017.

²⁶ ARABI, Abhner Youssif Mota. *Direito e tecnologia: relação cada vez mais necessária*. Disponível em: <<https://jota.info/artigos/direito-e-tecnologia-relacao-cada-vez-mais-necessaria-04012017>>. Acesso em 08 ago.2017.

²⁷ SANTOS, Boaventura de Sousa. *Um discurso sobre as ciências*. 5ª ed. São Paulo: Cortez Editora, 2008. P 89/90.

atuação face a suas externalidades. Dessa forma, as relações jurídicas, econômicas e as políticas públicas revelar-se-ão mais dinâmicas e atualizadas, de modo a extrair das tecnologias contemporâneas meios de integração e complementação recíprocas.²⁸

As vantagens advindas do incremento na integração entre o direito e a tecnologia não se limitam a uma melhor adequação do ordenamento jurídico a realidade social e conseqüente diminuição da insegurança jurídica, injustiça e desigualdade. O potencial contributivo que a tecnologia tem a oferecer ao direito é ainda maior que isso e, contraditoriamente pouco explorado.

De fato, “fator vantajoso para a tecnologia é que parece ser consenso que sua utilização possibilita criar maior proximidade entre a justiça e os cidadãos. Além disso, contribui para aumentar a celeridade da Justiça, um anseio e uma necessidade da sociedade moderna.”²⁹

Essa interface entre o direito e a tecnologia pode ser explorada tanto no âmbito do Direito da Tecnologia, como no âmbito da Tecnologia do Direito. A primeira vertente busca normatizar o uso dos novos recursos tecnológicos, enquanto a segunda visa aplicar os novos instrumentos tecnológicos ao cotidiano jurídico.

No âmbito do Direito da Tecnologia, por exemplo, a incorporação dos instrumentos tecnológicos ao direito pode ocorrer através da reforma da legislação e dos conceitos jurídicos, da criação de novas leis e da regulamentação do uso dos novos recursos. Por sua vez, essa interface na vertente da Tecnologia do Direito pode ocorrer com a incorporação dos instrumentos tecnológicos facilitadores no dia a dia jurídico e com o desenvolvimento de novas tecnologias para atender às demandas jurídicas existentes. Veja-se.

A reforma de velhos conceitos jurídicos deve acompanhar a inserção de recursos tecnológicos no direito e a própria regulamentação de uso de tais tecnologias. Isso faz que a reforma de códigos e a criação de legislação adequada seja tarefa essencial para uma integração eficiente e proveitosa de sistemas originalmente tão distantes.³⁰

Conforme preleção de Boaventura de Sousa Santos, as características negativas do método científico vigente (setorizado, reducionista, isolado e totalitário) se refletem na mentalidade dos próprios cientistas que adotam esse modelo.

Analogamente, para que a interface necessária entre direito e tecnologia ocorra, é imprescindível que ocorra a conscientização e participação da sociedade jurídica, pois, como toda mudança jurídica, a aceitação da tecnologia pelo direito perpassa pela chancela da sociedade. A capacidade da tecnologia influenciar e ser incorporada ao direito vai variar, portanto, com a cultura jurídica vigente. De fato, “a efetiva integração das disciplinas passa necessariamente pelo campo social, uma vez que não será realizada sem a forte participação das pessoas envolvidas nesse processo.”³¹

IV. CONCLUSÕES

O objetivo do presente trabalho foi apresentar de forma técnica e fundamentada um incentivo à integração entre direito e tecnologia, através do método emergente sugerido por Boaventura de Sousa Santos em sua obra “Um discurso sobre as ciências”.

Inicialmente, restou comprovado que, segundo Sousa Santos, o método científico vigente se caracteriza pelo seu viés fechado, setorizado, reducionista, isolado e totalitário. Tais características se refletem na mentalidade dos próprios cientistas que adotam esse modelo e trazem conseqüências negativas ao conhecimento por ele produzido.

Em seguida, demonstrou-se que, Segundo Santos, em razão das características acima expostas e das conseqüências negativas delas advindas, o método científico vigente atravessa uma profunda e irreversível crise, que atinge todos os setores da ciência. Destarte, ele propõe que o modelo antigo seja deixado de lado e que se busque um novo, mais adequado e capaz de atender as atuais necessidades do conhecimento contemporâneo.

Nesse sentido, viu-se que Boaventura expõe sua idéia de como será o próximo método científico emergente, levando em consideração as características que engendraram a crise do modelo atual e propondo que o novo sistema emergente terá características contrapostas. Nesse sentido, ao revés de um método fechado, setorizado, reducionista, isolado e totalitário (como o atual), ele propõe que o modelo emergente será aberto ao diálogo, multidisciplinar, abrangente e tolerante.

Constatou-se, ainda, que Santos é enfático ao afirmar que, diferentemente do sistema vigente, o novo modelo científico deve estar atento à realidade social.

²⁸ ARABI, Abhner Youssif Mota. *Direito e tecnologia: relação cada vez mais necessária*. Disponível em: <<https://jota.info/artigos/direito-e-tecnologia-relacao-cada-vez-mais-necessaria-04012017>>. Acesso em 08 ago.2017.

²⁹ KRAMES, Alexandre Golin; CARDOSO, Marcelo Herondino. *Sistemas Jurídicos e Tecnologia: evolução e influências*. Disponível em: <<http://www.egov.ufsc.br/portal/sites/default/files/anexos/29603-29619-1PB.pdf>>. Acesso em 10 ago. 2017.

³⁰ KRAMES, Alexandre Golin; CARDOSO, Marcelo Herondino. *Sistemas Jurídicos e Tecnologia: evolução e influências*. Disponível em: <<http://www.egov.ufsc.br/portal/sites/default/files/anexos/29603-29619-1PB.pdf>>. Acesso em 10 ago. 2017.

³¹ Ibidem.

Para ele, somente um método aberto ao diálogo, multidisciplinar, abrangente, tolerante e atento à realidade social é capaz de produzir o conhecimento local - capaz de captar e se adequar ao contexto social em que foi produzido - e total - bem sucedido em lidar com a complexidade dos objetos pesquisados.

Em seguida, verificou-se que o direito pode ser conceituado como o conjunto de instrumentos destinados a regular as relações humanas interpessoais, que são a sua própria razão de existir. Dessa forma, modificando-se a maneira como as relações interpessoais acontecem, modifica-se, por consequência, o próprio direito posto na sociedade.

Viu-se também que, os instrumentos tecnológicos evoluem de maneira rápida e revolucionária, provocando modificações diretas nas relações sociais. De forma totalmente oposta, verificou-se que o direito evolui de forma moderada e vagarosa, admitindo alterações somente após a sedimentação da situação social incorporada.

Restou comprovado que, em razão dessa diferença, a tecnologia e o direito se tornaram áreas opostas e isoladas, sendo raras as ocasiões em que ocorre integração entre ambas e que o produto dessa falta de diálogo entre as disciplinas é que o direito não acompanha as mudanças sociais advindas do avanço tecnológico.

Demonstrou-se também que quando o direito ignora as transformações sociais trazidas pela tecnologia, acaba inexoravelmente criando um distanciamento entre si e a realidade social, gerando insegurança jurídica, injustiça e desigualdade.

Constatou-se ainda que a tecnologia avança de forma rápida e revolucionária, provocando modificações diretas nas relações sociais, que por sua vez demandam adaptações no sistema jurídico vigente, que precisa se adequar. Demonstrou -se que, assim como evolui a tecnologia, é imprescindível que o direito também evolua, se adaptando à nova realidade demandada pelas relações sociais, de forma planejada e satisfatória.

Ao cabo, concluiu-se que, para que a interface necessária entre direito e tecnologia ocorra, é imprescindível que ocorra a conscientização e participação da sociedade jurídica, pois, como toda mudança jurídica, a aceitação da tecnologia pelo direito perpassa pela chancela da sociedade. A capacidade da tecnologia influenciar e ser incorporada ao direito vai variar, portanto, com a cultura jurídica vigente.

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Corporate Social Responsibilities and Ethics of Business – Issues and Challenges in India

By Dr. Shefali Panwar

Abstract- CSR and Ethics in business and government today are very important subjects. There are various reasons for businesses to operate in an ethical and socially responsible manner. There are government regulations, corporate belief systems, and basic common sense. There needs to be an overall intent to be ethical and socially responsible in today's business environment in order to stay successful. In India keeping this in view many big corporate houses like TATA, Mahindra & Mahindra Ltd and Birla started practicing the Corporate Social Responsibility (CSR) more than a decade ago. Now a day in India CSR is developing but not as much as in developed countries like America or China. Lack of understanding, inadequately trained personnel, coverage, policy etc. further adds to the reach and effectiveness of CSR programs. Large no. of companies are undertaking these activities superficially and promoting/ highlighting the activities in Media. The Main objective of this research paper is to study the various issues and challenges faced by CSR activities in India.

Keywords: CSR, business ethics, labour welfare, societal marketing.

GJMBR-G Classification: JEL Code: M14



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I. INTRODUCTION

Corporate social responsibility (CSR) refers to business activities which benefit society. These activities are of three categories, denotes as the triple bottom line, which are social, environment, and economic.

Now a days , a growing number of academics as well as top executives have been allocating a considerable amount of time and resources to Corporate Social Responsibility (CSR) strategies – i.e. the voluntary integration of social and environmental concerns in their companies' operations and in their interaction with stakeholders (European Commission, 2001).

According to the UN Global Compact – Accenture CEO study¹ (2010), 93 percent of the 766 participant CEOs from all over the world declared CSR as an “important” or “very important” factor for their organizations' future success. On the demand side, consumers are becoming increasingly aware of the firms' CSR performance: a recent 5,000-people survey by Edelman revealed that nearly two thirds of those interviewed cited “transparent and honest business practices” as the most important driver of a firm's

reputation. So in this research paper a detailed study has been made on various issues & challenges faced by various CSR activities by corporate.

India become first country in the world to make CSR mandatory, by company Act 2009 following an amendment to The Company Act, 2013 in April 2014.

II. OBJECTIVES

The objective of this paper is mainly concerned with the following objectives.

- To understand the concept of CSR.
- To determine the challenges in execution of Corporate Social Responsibility.
- To examine role of Corporate Social Responsibility Practices in Business.

III. RESEARCH METHODOLOGY

Descriptive research design has been used to conduct this research. Keeping in view of the set objectives, this research design was adopted to have greater accuracy and in depth analysis of the research study.

Secondary data was used for the research. Such as Different news articles, Books and Web.

IV. HISTORY OF CORPORATE SOCIAL RESPONSIBILITY

The term "corporate social responsibility" came into common use in the late 1960s and early 1970s after many multinational corporations formed the term stakeholder, meaning those on whom an organization's activities have an impact. It was used to describe corporate owners beyond shareholders as a result of an influential book by R. Edward Freeman, *Strategic management: a stakeholder approach* in 1984. Proponents argue that corporations make more long term profits by operating with a perspective, while critics argue that CSR distracts from the economic role of businesses. Others argue CSR is merely Window – Dressing, or an attempt to pre-empt the role of governments as a watchdog over powerful Multinational Corporations.

CSR is an aid to an organization's mission as well as a guide to what the company stands for and will uphold to its consumers. Development business ethics is one of the forms of applied ethics that examines

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ethical principles and moral or ethical problems that can arise in a business environment. ISO 26000 is the recognized international standard for CSR. Public sector organizations (the United Nations for example) adhere to the triple bottom line (TBL)

List of Top 10 Indian companies in CSR activities:

1. Tata Chemicals
2. Ambuja Cement
3. Infosys Ltd.
4. Mahindra & Mahindra Ltd.
5. Tata Motors Ltd.
6. Tata Power Company Ltd.
7. Bharat Petroleum Corporation
8. ITC Ltd.
9. Hindustan Zinc Ltd.
10. Indian Oil Corporation

Source: IIMU_CSR_REPORT_2018_OCT18_SINGLEPAGES.cdr

Few Global Corporate Initiatives related to CSR:

1. IKEA This Swedish company has taken step to support communities in crises, donating toys, by building schools, or facilitating access to drinking water. Most recently, the IKEA foundation has given \$2.3 million to bring clean electricity to a combined one million people in India and East Africa.
2. Organizations like Bharat Petroleum Corporation Limited, Maruti Suzuki India Limited, and Hindustan Unilever Limited, focus holistic development in the villages they have adopted. They provide better medical and sanitation facilities, build schools and houses, and help the villagers become self-reliant by teaching them vocational and business skills.
3. Tata Group focus on community improvement and poverty alleviation programs. It is engaged in women empowerment and rural community development. It also provides scholarships to students and endowments for various institutions.

The group is also engages in healthcare projects like facilitation of child education, immunization and creation of awareness of AIDS. Other areas include economic empowerment through agriculture programs, environment protection, providing sport scholarships, and infrastructure development such as hospitals, research centers, educational institutions, sports academy, and cultural centers.

4. Ultratech Cement: This company work for social causes in about 407 villages in the country aiming to create sustainability and self-reliance. Its CSR activities focus on healthcare and family welfare programs, education, infrastructure, environment, social welfare, and sustainable livelihood.
5. The company has organized medical camps, immunization programs, sanitization programs, school enrollment, plantation drives, water conservation programs, industrial training, and organic farming programs.

6. Mahindra & Mahindra: This company focuses on educational programs for economically and social disadvantaged communities. The CRS activities of this company focus on scholarships and grants, livelihood training, healthcare for remote areas, water conservation, and disaster relief programs. It run programs such as NANHI KALI, MAHINDRA PRIDE SCHOOL, LIFELINE EXPRESS.
7. ITC Group: This company through CSR activities has been able to generate sustainable livelihood opportunities for 6 million people. ITC Group by their e-Choupal(connect rural farmers through internet for procuring agricultural products) program covered around 40,000 villages and over four million farmers.
8. Bosch The Robert Bosch Stiftung Foundation become one of the largest and most active philanthropic organizations in the EU after donation of over \$100 million in 2017. Investing 50 percent of its R&D budget in technologies supporting conservation and environmental protection
9. Coca-Cola The Coca-Cola Foundation, from 1984, has donated more than \$820 million for women's empowerment, access to clean drinking water, and the development of disadvantaged youth. Every year, the company focus to give back one percent of its profits to communities around the world. In 2017, Coke gave \$250,000 to the American Indian College Fund for scholarships and community building for young Native Americans.
10. Levi's The company that made jeans a thing has made sure social responsibility is "sewn into the fabric" through initiatives like Water Less, which significantly reduces water use in manufacturing – by up to 96 percent for some styles. Since the campaign launched this program in 2011, Levi's has saved more than one billion liters of water. By 2020, the company expects to manufacture 80 percent of its products through this process, up from 25 percent today.

a) *Issues & Challenges of CSR*

Many companies think that business social responsibility is a peripheral issue for their business and customer satisfaction more important for them. They imagine that customer satisfaction is now only about price and service, but companies fail to point out on important changes that are taking place worldwide that could blow the business out of the water. The change is named as business responsibility which is an opportunity for the business.

Some of the driving forces which push business towards BSR include:

i. *Shrinking Role of Government*

In the past years, governments have relied on legislation and regulation to deliver social and environmental objectives in the business sector.

Shrinking government resources, coupled with a distrust of regulations, has led to the exploration of voluntary and non-regulatory initiatives instead.

ii. *Demands for Greater Disclosure*

The growing demand for corporate disclosure from including customers, stakeholders, suppliers, employees, communities, investors, and activist organizations.

iii. *Increased Customer Interest*

There are so many evidence that the ethical conduct of companies exerts a growing influence on the purchasing decisions of customers. In a recent survey by Environics International, more than one in five consumers reported having either rewarded or punished companies based on their perceived social performance.

iv. *Growing Investor Pressure*

Investors are getting aware about their rights. They are changing the way they assess companies' performance, and are making decisions based on criteria that include ethical concerns. The Social Investment Forum reports that in the US in 1999, there was more than \$2 trillion worth of assets invested in portfolios that used screens linked to the environment and responsibility. A separate survey by Environics International revealed that more than a quarter of share-owning Americans took into account ethical considerations when buying and selling stocks.

v. *Competitive Labour Markets*

Employees are increasingly looking beyond paychecks and benefits, and seeking out employers whose philosophies and operating practices match their own principles. In order to hire and retain skilled employees, companies are being forced to improve working conditions.

vi. *Supplier Relations*

So many companies are introducing codes of conduct for their suppliers, to ensure that other companies' policies or practices do not tarnish their reputation.

In India, over time, the expectations of the public has grown enormously with demands focusing on poverty alleviation, tackling unemployment, fighting inequality or forcing companies to take affirmative action.

The historical driver of CSR has been philanthropy or a sense of ethics. After the Second World War, a variety of national and international regulations arose through bodies such as the International Labor Organization (ILO) emphasizing the need for an active social policy for transnational companies (TNC's). This additional driver, international institutions, has relevance for India through the work of the ILO, the OECD, Socially Responsible Investment (SRI), the SA8000 Social Accountability scheme and through the work of the UN Commission on Human

Rights which tackled the human rights responsibilities of TNC's.

In India, some public sector companies can spend up to 5% of their profits on BSR activities.

The survey conducted by Times of India group on CSR used a sample size of 250 companies involved in CSR activities through a method of online administration of questionnaire. The questionnaire was evolved after due diligence including focus group meetings, consultations with key stakeholders and a pilot in four metros. Finally 82 organizations responded to the questionnaire. These comprised 11 public sector undertakings (PSUs), 39 private national agencies and 32 private multinational organizations. The respondent organizations form a satisfactory percentage of 33 per cent of the sample size, given the fact that only those companies that had direct or indirect involvement in CSR activities were chosen to be approached for the survey.

The survey analysis responses from participating organizations about various challenges facing BSR initiatives in different parts of the country. On the basis of responses obtained from the organization following challenges has been listed:

- ❖ **Lack of Community Participation in CSR Activities:** Local community's shows lack of interest in participating and contributing to BSR activities of companies. This is largely attributable to the fact that there exists little or no knowledge about BSR within the local communities as no serious efforts have been made to spread awareness about BSR. There is also lack of communication between the company and the community at the grassroots.
- ❖ **Need to Build Local Capacities:** Capacity building of the local non-governmental organizations is required for effectively contribution to the ongoing BSR activities initiated by companies.
- ❖ **Issues of Transparency:** Lack of transparency is one of the key issues. There is an expression by the companies that there exists lack of transparency on the part of the local implementing agencies as they do not make adequate efforts to disclose information on their programs, audit issues, impact assessment and utilization of funds. This reported lack of transparency impacts the process of trust building between companies and local communities, which is a key to the success of any BSR initiative at the local level.
- ❖ **Non-availability of Well Organized Non-governmental Organizations:** The survey also reported that there is non-availability of well organized nongovernmental organizations in remote and rural areas that can assess and identify real needs of the community and work along with companies to ensure successful implementation of

BSR activities. This also builds the case for investing in local communities by way of building their capacities to undertake development projects at local levels.

- ❖ Visibility Factor: Media also play a good role in highlighting good cases of successful BSR initiatives. This apparent influence of gaining visibility and branding exercise often leads many nongovernmental organizations to involve themselves in event-based programs; in the process, they often miss out on meaningful grassroots interventions.
- ❖ Non-availability of Clear CSR Guidelines: There are no clear Government guidelines or policy directives to give a definitive direction to BSR initiatives of companies. It is found that the scale of BSR initiatives of companies should depend upon their business size and profile.

V. CONCLUSION

The concept of CORPORATE social responsibility is now rooted on the global business agenda. But there are many obstacles need to be overcome. A key challenge facing business is the need for more reliable indicators of progress in the field of CSR, along with the dissemination of CSR strategies. Some of the Benefits of adopting the practice of CSR include:

- Company Benefits
 1. Improved financial performance;
 2. Lower operating costs;
 3. Enhanced brand image and reputation;
 4. Increased sales and customer loyalty;
 5. Greater productivity and quality;
 6. More ability to attract and retain employees;
 7. Reduced regulatory oversight;
 8. Access to capital;
 9. Workforce diversity;
 10. Product safety and decreased liability.
- Benefits to the Community and the General Public
 1. Charitable contributions;
 2. Employee volunteer programs;
 3. Corporate involvement in community education, employment and homelessness programs;
 4. Product safety and quality.
- Environmental Benefits
 1. Greater material recyclability;
 2. Better product durability and functionality;
 3. Greater use of renewable resources;
 4. Integration of environmental management tools into business plans, including life-cycle assessment and costing, environmental management standards, and eco-labelling.

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The Nexus between CSR Disclosure and Financial Performance: A Study on Islamic Sharia-Based Banking Companies in Bangladesh

By Md. Sumon Hossain

University of Rajshahi

Abstract - Purpose: The purpose of this study is to investigate the relationship between CSR disclosure and financial performance of listed Islamic Sharia-based banking companies in Bangladesh.

Methodology: In this study, Islamic Sharia-based banking companies listed on Dhaka Stock Exchange in Bangladesh is selected. Four listed Islamic Sharia-based banks (66.67%) among six listed banks are taken as sample randomly for this study. Content analysis is used to measure the extent of CSR disclosure of sample banks. A CSR checklist covering sixteen themes with eighty-five items is prepared and a period of 5 years ranges from 2011-2015 is taken for this study. Three accounting based financial performance indicators are used in this study such as return on assets, return on equity and earnings per share. Ordinary least square regression models and Panel data regression models (Fixed effects model or Random effects model) are used to analyze data. The Bruach-pagan multiplier test and Hausman specification test have been conducted to employ appropriate model for data analysis.

Findings: The findings of the study indicate that there is a statistically significant positive association between CSR disclosure and financial performance of Islamic sharia-based commercial banks in Bangladesh. The regression results show that CSR disclosure of sample banks is positively related to return on equity (ROE) and earnings per share (EPS) of Islamic Sharia-based commercial banks in Bangladesh at 10% ($p=0.085$) and 5% ($p=0.042$) level respectively. Listing age is positively associated with financial performance measures (return on assets at 1% level, return on equity at 1% level and earnings per share at 5% level). Despite showing the positive relationship between CSR disclosure and financial performance, the findings show no statistically significant linkage between CSR disclosure and return on assets. The ratio of independent director on board is negatively linked with earnings per share but not statistically significantly associated with return on assets and return on equity of Islamic sharia-based commercial banks. The coefficient of size (log of total assets) is negatively associated with return on assets on hand and no significant association is found with return on equity and earnings per share on the other hand.

Policy implication: The findings of the study suggest that it is advantageous to integrate CSR dimensions in Islamic Sharia-based commercial banks as business strategy. Formulation and implementation of a standard CSR policy could increase the reputation or image and assist to cope with external negative news or image –damaging incidents. Thus, it protects banks from incurring losses in the future.

Limitations: The study is based on only Islamic Sharia-based commercial banks listed on Dhaka Stock Exchange in Bangladesh. This sample size of the study is small and covers only five financial years. Annual reports of the sample banks of the study are the only source of information. So, the result may not be generalized to banking industry as well as financial companies in Bangladesh or other developing countries of the world.

Keywords: CSR Disclosure, Financial Performance, Listing Age, Independent Director, Size, Islamic Shariabased banks, Bangladesh.

GJMBR-G Classification: JEL Code:G00



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I. INTRODUCTION

The development of CSR concept has a long history. Parker (2011) found four industrial pioneers as leading actors in CSR thought of their time. They are Robert Owen (1771-1858), Titus Salt (1803-1876), George Cadbury (1839-1922) and William Hesketh Lever (1851-1925). Their charitable activities includes co-operative movement; child schooling; trade unionism; modernization of well-organized mill production technology; improvements in employees' quality of life by pursuing social welfare strategies for the workforce; implementing cooperative working practices; increasing employee benefits and sharing corporate prosperity with its workers; donating major gifts or property to a wide variety of organizations and charities; developing community facilities such as the building of hospitals, construction of a convalescent home for children, and many others (Parker, 2011). These four 'legends' are examples of such sophisticated business entrepreneurs who simultaneously conducted corporate operation to peruse business and social goals. It is astonishing that these people pursued these kinds of humanitarian activities willingly not from facing pressure from stakeholders or any legal bodies. Actually, they desired to integrate social and business goal in a single frame. In other words, these institutions seemed to combine their CSR activities with corporate governance practices.

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The banking industry is now a unique sector in an economy and plays a key role to ensure financial stability of a country. But now banking sector goes far beyond ensuring financial stability and involves in forming new strategies to provide desired services to various stakeholders. The banking industry is at the heart of society and it is expected to be more socially responsible (Chamber & Day, 2009). As a result, scholars all over the world have confessed and analyzed the significance of CSR programs of banking industry. In the present economic environment, it is crucial to integrate social, ethical, moral and environmental issues in their business activities (Evangelinos et al., 2009, p. 167). As a part of service industry, it is acknowledged that CSR is deep-rooted idea in the banking sector (Scholtens 2009, p. 159).

Islamic banking, Islamic finance or Sharia complaint finance is getting popularity day by day. Islamic sharia-based financial institutions perform financial transactions by complying with Sharia or Islamic law. The general aim of Islamic financial institutions is to contribute to the growth of an economy under the umbrella of Islam. The principle of Islam is to exercise equal rights among individual and ensure adequate benefits to live in the society. So, Islamic financial institutions utmost duty and responsibility is to engage in social, ethical and environmental activities. In other words, the "Islamicity" of Islamic banks requires CSR as a part of its proposed empirical model (Platnova et al., 2018). Islamic financial Institutions (IMIs) operate social programs but may not disclose those activities in its annual reports or websites. To motivate the management of Islamic banks to increase the CSR disclosure in their reporting documents, International regularity authority such as Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) have formulated standards for Islamic institutions. AAOIFI has issued standard No. 7 on regulation standard for Islamic Sharia-based banking companies in relation to CSR activities and disclosure in 2010. In this standard, CSR is described as "all activities carried out by an IFI to fulfill its religious, economic, legal, ethical and discretionary responsibilities as financial intermediaries for individuals and institutions." So, to act in accordance with the standard, Islamic banking companies necessitates to conduct various aspects of business functions differently in comparison to those of conventional banks.

To measure the level of CSR disclosure of Islamic Sharia-based commercial banks in Bangladesh, the annual reports of the sampled banks of the study were reviewed employing content analysis. Annual reports have been chosen as the source of information since these reports are frequently to communicate financial and non-financial information to external stakeholders. These reports are prepared under the

supervision of accountants and verified by auditors and provide a consistent measure (Tilt, 1994). In doing the disclosure analysis, this study has formulated a comprehensive CSR index focusing on CSR-related expectations of the stakeholders. Earlier studies on CSR disclosure of Islamic financial companies especially Islamic banks are used as a basis or guide for this study such as (Hossain & Neogy, (2019) Platnova et al., (2018), Haniffa & Hudaib (2007), Aribi and Gao (2012) and Aribi & Arun (2015). The structure of the paper is as follows: Section 2 provides the literature review and theoretical perspectives. Objectives and methodology of the study are presented in the Section 3 and 4 respectively. Section 5 represents the results and discussion on findings. Section 6 provides the policy implications of the study and section 7 summarizes the study.

II. LITERATURE REVIEW AND THEORETICAL PERSPECTIVES

a) Literature review

Islam as complete code of life gives guidelines to its followers in all sphere of life (Hamidullah, 2005). In religious perspective, life has two parts – life before death and life after death. Whether it is human being or other creature of almighty, none can stay alive for unlimited time in this earth. It is also very easily understandable that one who creates something once; he or she can surely built it twice or more. In this context, the Almighty Lord says in the Holy Quran:

"Allah – there is no deity except Him. He will surely assemble you for [account on] the Day of Resurrection, about which there is no doubt. And who is more truthful than Allah in statement." [Quran, 4: 87]"

The above mentioned Ayah indicates that the each human being of this earth will be reborn and will be evaluated for his beliefs and activities in this worldly life. A person will also be asked about fulfilling rights of fellow humans. Basically, Human being involves in business to earn profit. Business itself has a separate entity. Banking companies play key role in the money market. To conduct financial transaction, Islamic banking companies provide fruitful services to the customers. Majority of the people in Bangladesh is the follower of Islam, so, there is a satisfactory demand on Sharia-based financial institutions. In responding the emerging demand of Sharia-based banks in Bangladesh, a number of banks are operating. The main purpose of Islamic banking is to ensure financial services with justice and fairness to the society. It guarantees every customer to be served equally without any prejudice. Basically, research in social, environmental or non-financial disclosure in developing counties has appeared in late 1990s and early 2000s (with a few exceptions). As the basis of this research is

on a developing country, namely Bangladesh, it is relevant to review some available literatures relating to developing country perspectives. A few earlier research works on CSR reporting and financial performance are reviewed in the following paragraphs.

Platnova et al., (2018) have written an article on "The Impact of Corporate Social Responsibility Disclosure on Financial Performance: Evidence from the GCC Islamic Banking Sector". The purpose of the study is to examine the relationship between corporate social responsibility (CSR) and financial performance of Islamic banks in Gulf Cooperation Council (GCC) region over the periods 2000-2014. The study reveals that there is a significant positive relationship between CSR and financial performance of GCC Islamic banks. The results also indicate that there is positive impact of current CSR disclosure on future financial performance of Islamic banks in the GCC countries. Furthermore, the findings of the study show that there is no statistical significant relationship between CSR dimensions and current financial performance of sampled banks except "mission and vision" and "product and services" themes.

Millin et al (2013) has written an article on "Corporate Social Responsibility and Financial Performance in Islamic Banks". The objective of the study is to investigate the relationship between CSR disclosure and financial performance of Islamic banks. The CSR index indicates that Islamic banks involves in wide range of social activities both as individual banks and as countries. It is seen that Islamic banks are more committed to some dimensions such as vision and mission, board and top management, financial products or services and less attention is given on environment theme. The regression results show a positive association between CSR disclosure and financial performance.

Siswenty (2018) has written an article on "The Influence of Financial Performance and Non- Financial Performance on Islamic Social Responsibility Disclosure: Evidence from Islamic Banks in Indonesia". The study aims to find out factors that influence the Islamic social disclosure in Islamic Banking companies and the linkage between social reporting and financial performance. The findings of the research indicate that financial performance of Islamic banks does not have any influence on CSR reporting while compliance of sharia principles, Sharia supervisory board have significant influence on Islamic social reporting.

Shafiqur, Sadia & Nicholas (2010) have written an article on "CSR by Islami Banks in healthcare-stakeholders' perception". The objective of the study is to explore the stakeholders' insight of CSR support in the healthcare sector by Islami Bank Bangladesh Limited (IBBL). The finding of the study is that the stakeholders believe that this hospital (Islami Bank Central Hospital) is significantly contributing to the society through its funding in healthcare sector. The

limitations of the study are: The results of the study may not be generalized as the sample size of the study is very small. As non-random sampling method was used, so the research is less reliable and relevant.

Amirul et al., (2017) have written an article on "Corporate Social Performance (CSP) Influences on Islamic Bank's Financial Performance". The objective of the research work is to assess the impact of corporate social performance (CSP) such as legal, ethical, economic and discretionary responsibilities on Islamic banks financial performance. The finding show that Islamic banks has meet up minimum level of each responsibilities and provide much attention on discretionary responsibilities which is the pinnacle stage of CSP. This study is focused on only one Islamic bank and may not reflect other Islamic banks' picture in the county or other areas. The number of observations is too small to conduct robust and rigorous analysis.

El-Halaby & Hussainey (2015) assessed the corporate social responsibility conduct and disclosure (CSRCD) of 138 Islamic banks from 25 countries by employing content analysis (websites and annual reports). Their findings confirmed the early works conducted by Maali et al., (2006) which described the number of Islamic banks still low in term of disclosing their CSP and social activities. Nevertheless, there is progress from 2006 to 2015 when El-Halaby & Hussainey (2015) result shows higher percentages than Maali et al., (2006), and consistent with Haniffa and Hudaib (2007) on the gap between the findings and expectations towards the CSRCD.

Hasan (2013) has written an article on "Corporate Social Responsibility in the Banking Sector: A Comparative Study on Some Commercial Banks in Bangladesh". The objectives of the study are, (a) to ascertain the main areas where CSR programs are being accomplished by private commercial banks (PCB) and state-owned banks (SOB) and (c) to evaluate the contribution of CSR activities of PCB and SOB. This study found that the expenditure incurred by commercial banks to CSR programs is very immaterial. SOBs have not reached so ahead in participating in CSR areas. The limitations of the study are: (1) The study is exclusively descriptive in nature; (2) Only secondary sources of data are used; (3) The sample size of the work is very small and (4) The study covered only two years, so the findings cannot be generalized in the other periods.

b) *Theoretical perspectives of CSR disclosure*

CSR disclosure has been subject to considerable academic research in the field of accounting. A number of theories have been proposed to explain why business organization report CSR information voluntarily. Islamic banks' literatures suggest two major issues that influence the Islamic banks CSR disclosure-socio-political context within which banks operate and economic opportunities available to Islamic

banks. In this regard, wood 1991 conceptualization and political economy theory are noteworthy. A brief discussion about these theories is made in the following section.

i. *Wood 1991 Conceptualization*

A model proposed by Wood (1991) establishes a noteworthy improvement in CSR study. Wood

(1991:693) defined Corporate Social Performance (CSP) as 'A business organization's configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm's societal relationships.'

The CSP model (Wood, 1991)

Principles of CSR₁

- Institutional principle: legitimacy
- Organizational principle: public responsibility
- Individual principle: managerial discretion

Processes of CSR₂

- Environmental assessment
- Stakeholder management
- Issues management

Outcomes of corporate behavior

- Social impacts
- Social programs
- Social policies

Wood's model of CSP

Source: Wood (1991: 694).

In this model, CSP is hypothesized as including three aspects – Principles of CSR, Processes of CSR and Outcomes of corporate behavior. Principle of CSR₁ includes institutional principle, organizational principle and individual principle. In processing CSR programs, environmental assessment, stakeholder management and issues management are duly considered. In this model, outcomes are classified into three categories- the social impacts of corporate behavior, the programs companies conduct to implement social responsibility and the policies developed by the companies to handle social issues and stakeholder interests.

ii. *Political Economy Theory*

It is assumed by many scholars that legitimacy theory and stakeholder theory have both arisen from a bigger theory termed as political economy theory. The 'political economy' itself has been defined by Gray et al. (1996, p. 47) as "the social, political and economic framework within which human life takes place". Deegan (2009) mentioned that by regarding political economy theory, an academic is capable to reflect wider (social) issues that influence on how corporation runs, and what information it takes to disclose. The political economy treats accounting statements as social, environmental, political or economic evidence and they are used as an instrument to contribute to the businesses' private interest (Guthrie and Parker, 1990). A distinction has been drawn by Buhr (1998) between the legitimacy theory and political economy theory. Buhr tells that both

(legitimacy theory and political economy theory) serve to ensure legitimacy but means and motivation are seen in a different way. The difference happens in the explanation of reporting choice. For example, if 'the disclosure choice' focuses on the social constructionist perspective, it is consistent with the legitimacy theory, whereas if it focuses on the hegemonic perspective, it is more consistent with political economy theory (Buhr, 1998).

III. OBJECTIVES OF THE STUDY

Overall objectives of the study is to investigate the relationship between CSR disclosure and financial performance of Islamic Sharia-based commercial banks in Bangladesh

The specific objectives of this study are as follows:

- i. To examine the association between the extent of CSR disclosure and return on assets (ROA) of Islamic Sharia-based commercial banks in Bangladesh.
- ii. To investigate the empirical relationship between CSR disclosure and return on equity (ROE) of Islamic Sharia-based commercial banks in Bangladesh.
- iii. To assess the impact of CSR disclosure on earnings per share (EPS) of Islamic Sharia-based commercial banks in Bangladesh.

IV. METHODOLOGY OF THE STUDY

The methodology is the general research strategy that outlines the way in which research is to be undertaken. In simple terms, it is a planned and systematic way of doing research. In the following section, the methodological aspects of this study have been provided.

a) Sample Selection

Simple random sampling technique is employed to select the sample banks. There are 6 Islamic Sharia-based commercial banks which are listed on Dhaka Stock Exchange (DSE) in Bangladesh. Among

$$CSRI = \frac{\sum_{i=1}^n X_{ij}}{nj} ; \text{Where,}$$

$$CSR_{jt} = \text{Corporate Social Responsibility Index of } j\text{th firm}'$$

$$nj = \text{Total number of CSR items for } j\text{th firm, } n=85$$

$$X_{jt} = 1 \text{ if } i\text{th item is disclosed, } 0 \text{ if } i\text{th item is not disclosed.}$$

$$\text{So that } 0 \leq CSR_{jt} \leq 1$$

c) Banks' financial performance indicators

Financial performance of a business can be assessed based on two crucial indicators i, .e., a) investors' return b) accounting return. It indicates that profit should be measured from the perspective of shareholders' and firms' earnings. Waddock and Graves (1997) measured financial performance by using three accounting variables namely return on asset, return on equity and return on sales. Besides these indicators, many researchers used other accounting measures such as sales growth, total assets, operating income growth, earnings per share (EPS) or Price-Earning (P/E) (Bragdon & Marlin 1972). Mcguire *et al.*, (1988) state that accounting based tools are more operative in predicting CSR than market based indicators. But, Karagiorgos (2010) emphasizes that market –based indicators represent a positive and significant relationship with CSR.

Considering different scholars' opinions, this study adopts three accounting based measures to examine the relationship with CSR disclosure. These three ratios are Return on Asset (ROA), Return on Equity (ROE) and Earning per Share (EPS). These three indicators of financial performance are preferred because these are the most practical and significant measures to detect the association between CSR disclosure and financial performance in previous studies (Mcgruie *et al.*, 1988). These three accounting tools are explained in the following sections.

i. Return on Asset (ROA)

Basically, Return on Asset (ROA) is a fundamental profitability indicator that is employed to assess the efficiency of a business's assets. It implies

these 6 banks, 4 (66.67% to population) banks are selected randomly for this study (Appendix A).

b) Construction of CSR Index

A comprehensive CSR disclosure index has been developed based on previous literature review. The CSR index comprise of 16 themes with 85 items of CSR reporting. Un-weighted index is employed providing each items equal weight to total score. If a banking company (bank) disclosed CSR items in its annual report it scored "1" while banks that did not disclose an item scored '0' (Gujarati, 2009). The disclosure model is additive and un-weighted index are calculated as follows (Hossain & Neogy, 2019):

how efficiently and effectively a business is receiving earning advantage based on its assets. This ratio is widely and popularly used to compare banks' financial performance from year to year and bank to bank. Many studies have employed ROA to discover the linkage between ROA and CSR disclosure (Stanwick & Stanwick, 1988; Mcwilliams & Siegel 2000; Salam, 2009; Soana, 2011b; Ehsan & Kaleem, 2012). The association between CSR and ROA has been seen to be positive by Emilson, Classon & Bredmar (2012), Griffin & Mahon (1997), Mcguire *et al.*, (1988). However, Khan & Hasan (2013), McWilliams & Siegel (2000) found no link between CSR and ROA.

ii. Return on Equity (ROE)

Return on Equity (ROE) is the amount of net income returned as percentage of shareholders' equity. Return on equity measures a company's profitability by revealing how much profit a company generates from the money shareholders have invested. ROE is especially used for comparing the performance of companies in the same industry. ROE is a measure of management's ability to generate income from the equity available to it. ROEs of 15-20% are generally considered good.

iii. Earning per share (EPS)

One of the important indicators of profitability of a company is earnings per share. It is the share of a company's profit allocated to each outstanding share of common stock.

EPS is calculated as,

$$= \frac{\text{Net Income} - \text{Dividends on Preferred Stock}}{\text{Weighted average number of common Shares outstanding}}$$

It may be noted that use of weighted average number of shares outstanding is more reliable and accurate as number of shares outstanding may alter over time. Several studies have employed an EPS to reveal the relationship with CSR disclosure and other variables (Pava & Krausz, 1996; Moore, 2001; Dragomir, 2010). Kwanbo (2011) recommends that the link between societal disclosure and earnings per share of public companies in Nigeria is not significant. So, CSR reporting is not so crucial issue in increasing profit of a firm. On the other hand, it is evident that the association between CSR and EPS (ROA and ROE) is positive and significant (Ehsan & Kaleem, 2012). So, the issue relating to direction of the relationship between CSR disclosure and earnings per share (EPS) is still unresolved.

d) *Measurement of Control Variables*

This study considers some variables as control variables which are related to the linkage between CSR disclosure and financial performance of sample banks. Therefore, this study has used (i) firm size (ii) firm age (iii) percentage of independent directors in board as control variables for measuring the link between CSR disclosure and financial performance.

i. *Firm Size*

Firm size is a crucial factor that might influence the functions and performance of a firm. In earlier studies, it is seen that, firm size was significantly correlated with CSR disclosure and financial performance (Patten, 1991; Gray, 1995; Deegan & Rankin, 1996, Waddock & Graves (1997) indicate that bigger firms may have larger resources than those of smaller firms to conduct more societal and eco-friendly activities. Firm size can be defined in a number of ways and there is no overriding cause to favor one over another(s) (Cooke, 1991). A number of measures of size have been used by many investigators such as turnover, total assets, fixed assets, paid up capital, shareholders' equity, capital employed, number of employees, number of shareholders, number of branches etc. The present study includes total assets as a proxy for size.

ii. *Firm Age*

Age of a business organization is also another vital factor that may influence the volume of corporate social responsibility disclosure. The relation between CSR and financial performance could be affected by firm age (Schreck, 2011, Pelozo, 2006, Suttipan, 2012). Some studies advocate that younger businesses do not have much concentration on CSR activities; rather, emphasize on maintaining profitability. After achieving healthy financial performance, businesses may invest in protecting their reputation by increasing CSR programs. Roberts (1992) has found positive relationship between firm age and CSR disclosure. Again, Roberts argue that "Sponsorship withdrawal could signal to stakeholders

that the corporation expects financial or managerial disturbances". However, Ehsan & Kaleem (2012) argue that age of firm in Pakistan was not found considerably related to CSR disclosure. Mennessa (2012) and Sukcharoensin (2012) find that there is no relationship between CSR disclosure and firm age.

In the light of above information, it can be said that firm age may influence the association between CSR disclosure and financial performance and age of business organization is included in this study as a control variable. Age is measured by number of years since the firm was listed on the Dhaka Stock Exchange (DSE) in Bangladesh.

iii. *Independent director*

Corporate governance is must for successful operation of a business. An independent director is a part of corporate governance. Independent directors are non-executives of a company who assist a company in improving corporate credibility and governance standards. Our companies Act 1994 does not provide any provision on Independent directors. However, Indian Companies Act 2013 provides the definition of Independent director as under:

An Independent director in relation to a company, means a director other than a managing director, a full time director or a nominee director-

- a) Who, in the opinion of board a person of integrity and possesses relevant expertise and experience;
- b) Who or was not a promoter of the company or its holding, subsidiary or associate company
- c) Who has or had no precautionary relationship with the company, its holding, subsidiary or associate company or their promoters, or directors during the two immediately preceding financial years or during the current financial years.
- d) None of whose relatives has or had pecuniary relationship or transaction with the company, its holding, subsidiary or associate company, or their promoters, or directors, amounting to two per cent or more of its gross turnover or total income or fifty lakh rupees or such higher amount as may be prescribed, whichever is lower, during the two immediately preceding financial years or during the current financial years.
- e) Who, neither himself nor any of his relatives-
 - i. Hold or has held the position of a key managerial personnel or is or has been employee of the company or its holding, subsidiary or associate company in any of the three financial year immediately preceding the financial year in which he is proposed to be appointed:
 - ii. Is or has been an employee or proprietor or a partner, in any of the three financial years immediately preceding the financial year in which he is proposed to be appointed, of-

- A. A firm of auditors or company secretaries in practice or cost auditors of the company or its holding, subsidiary or associate company ; or
 - B. Any legal or consulting firm that has or had any transaction with the company, or its holding, subsidiary or associate company amounting to ten percent or more of the gross turnover of such firm;
 - iii. Holds together with his relatives two percent or more of the total voting power of the company
 - iv. Is a chief Executive or director, by whatever name called, of any non-profit organization that receive twenty five percent or more of its receipts from the company, any of its promoters, directors or its holding, subsidiary or associate company or that holds two percent or more of the total voting power of the company.
- Business or corporate leader
 - Bureaucrats with long exposures in management.
 - University Teacher with Economics or Business Studies or Law background.
 - Professional like-Chartered Accountants, Cost and Management Accountant, Chartered Secretaries.
 - Must have at least 12 (twelve) years of corporate management/ professional experiences.

Arshad et al (2010) and Khan et al (2013) found that independent directors influence the extent of voluntary disclosure. Wang et al, (2012) claim that increased number of independent directors of a board try to boost managers to disclose more voluntary information. It is also seen that a higher number of independent directors were positively and significantly related with CSR (Cheng, et al, 2006). In this research, the independent directors of banking companies are measured as the percentage of independent directors on the board of banking companies in relation to total number of directors in the board.

Following persons are competent for appointment of Independent director as per corporate governance guidelines issued by the Bangladesh Securities and Exchange Commission notification:

Table 1: The summary of Description and Measurement of Variables

Corporate Social Disclosure Index Variable	
$CSRI_{jt} =$	A variable of corporate social disclosure index of j firm in the period of t . It is defined as number of CSR items which firm disclosed divided by total CSR disclosure items (85 items).
Financial Performance Measures Variables	
$ROA_{jt} =$	A variable of return on assets of firm j during period t . It is defined as Profit after tax (PAT) divided by total assets
$ROE_{jt} =$	A variable of return on equity of firm j during period t . It is defined as Profit after tax (PAT) divided by shareholders' equity.
$EPS_{jt} =$	A variable of earning per share of firm j in the period of t . It is defined as the earnings after tax and preferred dividend scaled by total outstanding share.
Control Variables	
$SIZE-TA_{jt} =$	A variable of firm size of firm j in the period of t . It is defined as the Total Assets.
$AGE_{jt} =$	A variable of firm age of firm j in the period of t . It is defined as number of years since firms was listed on DSE.
$IDIRECTOR_{jt} =$	A variable of the independent director ratio of firm j in period t . It is defined as number of independent director divided by total number of directors in the board of firm
$\epsilon_{jt} =$	A random error of firm j in period t .

Source: Author's Preparation

e) *Regression Models for Analysis*

This study tries to compare two types of regression models to analyze the relationship between CSR disclosure and financial performance of Islamic Sharia-based banking companies in Bangladesh. These two types of regression models are ordinary least square models and panel data models. They are described as follows:

i. *A Pooled Ordinary Least Squares Model (POLS) or Constant Coefficient Model*

The pooled OLS considers constant coefficients with the usual assumption for cross-section data (Cameron and Trivedi, 2008) and controls for year. This method assumes that regressors are not correlated with

the error or the intercept and the slope are equal for all data.

ii. *Panel Data Model*

Panel data is also known as longitudinal data. In panel data model, the behavior/ information of individual or firms or units are measured across time (Baum, 2006). Gujrati (2009) emphasizes on panel data models as it can identify and measure or analyze such type of information or data that cannot be detect in cross-section analysis. Depending upon the nature of panel data, random effect models (RE) or fixed effect models (FE) are used in regression analysis.

The random effect model (RE) assumes that the unobservable individual effects are random variables

and uncorrelated with the independent or predictor variables in the model. Furthermore, the fixed effect model (FE) explores the link between the predictor and outcome variables within a unit. This model assumes that unobservable individual effects are potentially correlated or impacted with the observed (outcome) regressors. It removes the influence of time-invariant characteristics of data (Torres- Reyna, 2013).

To better comprehend the association between CSR disclosure and financial performance in the Bangladeshi context, this study has used the above described regression models to examine the link between CSR disclosure and financial performance, as well as other firm characteristics, such as size of entity, age of company and percentage of independent directors. The dependent variables in this study are ROA, ROE and EPS as the measures of financial performance. The independent variables are CSR disclosure index and the control variables.

f) *Specimen Test*

The following tests have been adopted to specify the appropriate model among pooled OLS, random effects model and fixed effects model.

i. *The Breusch and Pagan Lagrange Multiplier Test: Pooled OLS or Random Effects Model*

The Bruesch-pagan LM test is employed to identify appropriate model between pooled OLS and random effects model. The null hypothesis is that the

variance across entities is zero or no random effects exist in the model ($H_0: \sigma^2_{\eta} = 0$) (Gujrati, 2009). It implies that there exists no panel effect or difference across entities. A Chi square distribution value with 1 degree of freedom will be determined, if the null hypothesis is rejected, then random effects is appropriate over the pooled OLS model. If null hypothesis is accepted, the pooled OLS model is more suitable than other models.

ii. *Hausman Test: Random Effects or Fixed Effects Model*

The Hausman test is employed to examine whether random effects or fixed effects are appropriate. The null hypothesis is that the individual effects are not correlated with other regressors in the model. If the test shows an insignificant P value, the null hypothesis is accepted. The random effects produce unbiased estimators, indicating that random effects are appropriate. If the test indicated a significant P-value, the null hypothesis is rejected and it indicates that fixed effects model is more appropriate than random effects model.

g) *Hypotheses Development*

A hypothesis is a definite, testable estimate about what we expect to happen in our study. To being consistent with the aims of this study, the following hypotheses are framed. Here, hypothesis defines CSR disclosure as independent variable. The alternative hypothesis consists of the following sub-hypotheses:

H _{a1}	There is a positive and significant relationship between CSR disclosure and Return on asset (ROA).
H _{a2}	There is a positive and significant relationship between CSR disclosure and Return on equity (ROE).
H _{a3}	There is a positive and significant relationship between CSR disclosure and Earning per share (EPS).

h) *Model and Hypothesis Testing*

To test the relationship between CSR disclosure and financial performance in Islamic Sharia-based banking companies listed under DSE in Bangladesh, this study has used different regression models (Fixed effects or Random effects models). It has been

mentioned that this study defines regression models based on financial performance measures as dependent variables. As a result, this study has estimated the following models using financial performance indicators' as dependent variable and CSR disclosure as independent variable.

CSR disclosure and Return on Asset (ROA) testing

$$Model\ 1: Y(ROA_{it}) = \beta_{0it} + \beta_1 CSR_{it} + \beta_2 AGE_{it} + \beta_3 IDIRECTOR_{it} + \beta_4 SIZE-TA_{it} + \epsilon_{it}$$

CSR disclosure and Return on Equity (ROE) testing

$$Model\ 2: Y(ROE_{it}) = \beta_{0it} + \beta_1 CSR_{it} + \beta_2 AGE_{it} + \beta_3 IDIRECTOR_{it} + \beta_4 SIZE-TA_{it} + \epsilon_{it}$$

CSR disclosure and Earnings per share (EPS) testing

$$Model\ 3: Y(EPS_{it}) = \beta_{0it} + \beta_1 CSR_{it} + \beta_2 AGE_{it} + \beta_3 IDIRECTOR_{it} + \beta_4 SIZE-TA_{it} + \epsilon_{it}$$

i) *Choice of the Study Period*

A period 5 years ranging from 2011-2015 has been selected for the present study. The reason of choosing the period is that these years are not affected by abnormality. It should be mentioned that Bangladesh share market threatened by a severe stock market

breakdown due to price bubble in 2010 (Barua. 2014) and gradually turn as normal in 2011. So, the consideration of data from 2011 may assist to elude the distortion from the share market collapse. Consequently, in regards to corporate social disclosure data, this study considers from 2011 and onwards. Also the periods are

chosen just after the declaration of CSR policy by Bangladesh bank.

j) Sources of Data

Secondary sources of data are used in this research. The secondary sources of data of the current study are-

(a)Annual reports of sample banks; (b) published journals; (c) websites; (d) Newspapers; (e) published books; (f) Rules and Acts of regularity bodies; (g) published and unpublished PhD and M. Phil theses.

k) Tools of Analysis

To achieve the objectives of the present study and to ensure reliability of data, different statistical tools such as average, standard deviation, Minimum, Maximum, skewness, kurtosis, correlation, regression, correlation matrix, variance inflation factor (VIF) have been used for analyzing the data and testing the hypotheses. For making the analysis easy and fast, SPSS and Strata software were used.

V. ANALYSIS AND DISCUSSION

a) Descriptive Statistics of the study

Table 2 presents the descriptive statistics of the variables as part of the model examined, covering both dependent variables and independent variables across the 20 observations collected. Table 2 shows that the average CSR disclosure of the entire sample banks (Islamic Sharia-based commercial banks in Bangladesh) over the periods covered is 26.383% with a standard deviation of 13.20%. The mean CSR disclosure indicates that the level of CSR disclosure is relatively low despite the Islamic ethics at the center of Islamic banking and the standard deviation reflects a small level of dispersion from the mean. The highest CSR disclosure value is 48.24% and the lowest value is 7.06%. Thus, the CSR disclosure of Islamic Sharia-based commercial banks in Bangladesh over the period 2011-2015 is quite unstable.

Table 2: Showing the descriptive statistics of the variable of the study

Variables	Observation	Mean	Std. Dev.	Min	Max
CSR disclosure	20	26.383	13.19965	7.06	48.24
ROA	20	-0.5635	3.123895	-9.97	1.75
ROE	20	9.152	5.135919	0.63	17.42
EPS	20	1.449	1.905084	-2.7	4.84
Age	20	17	10.88217	4	30
IDDirector	20	18.7395	10.01441	6.67	42
Total Assets	20	246713	270686.7	12752.9	8595201.6

Source: Author's Preparation based on sample banks annual reports

Table 2 shows that the highest ROA for all sample banks over the study period is 1.75% and the lowest value is -9.97%. The mean ROA value is -0.5636 % with a standard deviation of 3.123895%. The average ROE of sample banks is 9.152% with a standard deviation of 5.135919%. The minimum ROE of sample banks is 0.63% and the highest ROE is 17.42%. The mean EPS of sample banks for the period covered (2011-2015) is 1.449 with a standard deviation of 1.91. The highest EPS is 4.84 and the lowest value of EPS of sample banks is -2.7.

Considering the control variables of this study, we found that the listing age of sample banks ranges from 4 years to 30 years with a mean age of 10.88 years. The percentage of independent director on board ranged between 42 percent and 6.67 percent, having a mean value of 10.01 percent. It indicates that Islamic Sharia-based commercial banks in Bangladesh do not comply with the Bangladesh bank guideline regarding appointment of independent director on board as the average percentage of independent director is below 20%. Table 2 represents that the highest value of total assets is 8595201.6 and the lowest value is 12752.9. The mean value of total assets of the entire sample

banks of the period covered is 246713 with a standard deviation of 270686.7.

b) Skewness and Kurtosis statistics

To test the normality of data, skewness and kurtosis statistics are found out. Normality in data is often a conventional assumption in the estimation process (Bai & Ng, 2005). Data distribution with either a high skewed nature or with high kurtosis is indicative of non-normality which has random effects on specification or estimation (Hall & Wang, 2005). "An outlier is a case with such an extreme value on one variable (a univariate outlier) or such a strange combination of scores on two or more variables (a multivariate outlier) that they distort statistics (Tabachnick & Fidell, 2001).



Table 3: Skewness and Kurtosis statistics

Description	Skewness	Kurtosis
	Statistic	Statistic
CSRD	.235	-1.004
ROA	-1.146	2.039
ROE	-.218	-.985
EPS	-.368	.232
OP	.146	-1.515
Age	.000	-2.133
IDirector	1.168	.570
SIZE (TA)	1.247	.208

Source: Author's Preparation based on sample banks annual reports

At the beginning stage, descriptive statistics analysis using the mean score of components of dependent and independent variables was conducted and it was found that Kurtosis scores are (<3) for all the variables of the study (shown in Table 3). For skewness, indices have been used for acceptable limits of ± 2 (Trochim & Donnelly, 2006; Field, 2000; Gravetter & Wallnau, 2014). It is found that all skewness statistics are below ± 2 (Table 3). So, it can be concluded that the data of the study are normally distributed.

c) Testing of Multicollinearity

Based on normally distributed data, VIF test were conducted to detect the existence of multicollinearity among the independent variables of the study. As can be seen in Table 4, the maximum VIF value is 5.864 and lowest VIF value is 1.929. Commonly accepted threshold for multicollinearity is a VIF value of 10 (Hair et al 2010, Pp 204, 212), these results are regarded statistically acceptable, showing that multicollinearity is not a problem in this study.

Table 4: Showing the tolerance and variance inflation factor values

Independent variables	Collinearity Statistics	
	Tolerance	VIF
CSRD	.171	5.864
Age	.518	1.929
IDirector	.343	2.928
Log-asset	.394	2.541

Source: Author's preparation based on annual reports

d) Extent of CSR disclosure of Islamic Sharia-based banking companies (2011-2015)

Table 5: Showing the extent of CSR disclosure of sample banks

Bank	Mean CSR disclosure	Standard deviation
IBBL	44.24%	4.68%
FSIBL	19.53%	8.98%
SJIBL	29.18%	4.95%
ICBIBL	10.59%	3.33%

Source: Author's preparation from annual reports of sample banks

Table 5 shows the level of CSR disclosure of sample banks over the study period 2011-2015. It is seen that IBBL is on the top among the sample banks that has disclosed on an average of 44.24% of CSR information with a standard deviation of 4.68%. Second most disclosed bank is SJIBL (mean CSR disclosure=29.18%, Standard deviation =4.95%). FSIBL has occupied 3rd position in respect of CSR reporting in

its annual reports. ICIBL is the least disclosed bank in CSR reporting among the sample banks of the study.

e) *Examination of Empirical Relationship between CSR Disclosure and Financial Performance*

i. *The relationship between CSR disclosure and Return on assets (ROA) (ROA as dependent variable)*

In order to explain the relationship between CSR disclosure and return on assets of Islamic Shari-based banking companies in Bangladesh, panel data regression models are run and the obtain results are discussed in the following sections. The obtained results are shown in Table 6 & 7.

a. *The Bruech-Pagan Lagrange Multiplier Test*

Here it is assumed that the pooled OLS model is more appropriate than random effects model (Null hypothesis). The Breusch-Pagan Lagrange Multiplier

test (Table 6) with the Chi square value of 0.00 is significant at 100% level of significance indicates that the null hypothesis is accepted and alternative is rejected.

b. *The Hausman Test*

In this part, the Hausman test is employed to determine whether random effect model is appropriate or fixed effect model. From the result reported in Table it is observed that the null hypothesis is rejected as the value of Chi-square (31.22) is statistically significant 1% level of significance which implies that the individual effects are correlated with other independent variables taken in the regression model. So, fixed effects model is more appropriate than random effects model.

Table 6: Showing appropriate regression model for the analysis

Test name	Chi-Square	Prob.	Comment
Hausman Test	31.22	0.000	Alternative accepted
Breusch-Pagan Lagrange Multiplier	0.00	1.000	Alternative rejected

Source: Author's preparation based on panel data of the study

Table 7: Regression results when return on assets (ROA) is used as dependent variable and CSR disclosure is used as independent variable using fixed effect model

Explanatory variables	Coefficients	Std. error	t-value	p-value
CSRDIS	0.01745	0.074528	0.23	0.819
AGE	1.140504	0.2567497	4.44	0.001
IDIRECTOR	-0.0645478	0.0611253	-1.06	0.312
SIZE (TA) (log)	-5.909834	2.166947	-2.73	0.018
Constant	49.82692	23.04066	2.16	0.051
Group:4; Total observations; 20; R-Squared: 0.5062				

Source: Author's preparation based on panel data of the study

Table 7 represents the regression results using fixed effects model where return on assets (ROA) is used as dependent variable and CSR disclosure, listing age, percentage of independent director on board and log of total assets are used as independent variables. It is found that the model is significant at 1% level (Prob> Chi²=0.000) and explains 50.62% of the variability of dependent variable (ROA) in the Islamic Shari-based banking companies in Bangladesh. As can be seen from Table 7, the CSR disclosure index is statistically significant at P=0.819. On the basis of results, it is evident that there is no significant relationship between CSR disclosure and return on assets of Islamic Shari-based banking companies in Bangladesh. As the results show, two out three control variables are statistically significant: age at p=0.001 and size (total assets) at p=0.018. The coefficient of Independent director is negative but statistically insignificant. It implies that there is no significant association between return on assets and Independent director. The results relating to the relationship between CSR disclosure and return on assets (ROA) is inconsistent with the previous studies, such as those of Scholtens (2009) and Simpson & Kohers (2012).

ii. *The relationship between CSR disclosure and Return on equity (ROE) (ROE as dependent variable)*

a. *The examination of random effect using the Lagrange multiplier test*

Here it is assumed that the pooled OLS model is more appropriate than random effects model (Null hypothesis). The Breusch-Pagan Lagrange Multiplier Test (Table 8) with the Chi square value (0.00) is not statistically significant at level of significance indicates that the null hypothesis is accepted and alternative is rejected.

b. *Results of the Hausman Test*

In this part, the Hausman test is employed to determine whether random effect model is appropriate or fixed effect model. From the result reported in Table 8 it is observed that the null hypothesis is rejected as the value of Chi-square (5.30) is statistically significant at 25.81 % level of significance which implies that the individual effects are not correlated with other independent variables taken in the regression model. Finally, OLS regression model is more appropriate over both fixed effect and random effect model.

Table 8: Showing appropriate model for the analysis

Test name	Chi-Square	Prob.	Comment
Hausman Test	5.30	0.2581	Alternative rejected
Breusch-Pagan Lagrange Multiplier	0.00	1.00	Alternative rejected

Source: Author's preparation based on panel data of the study

Table 9: Regression results showing when return on equity (ROE) used as dependent variables and CSR disclosure is used as independent variable using ordinary least square regression method

Explanatory variables	Coefficients	Std. error	t-value	p-value
CSR	.2374281	.1285295	1.85	0.085
AGE	-.2202997	.0688066	-3.20	0.006
IDIRECTOR	-.1290627	.0890615	-1.45	0.168
SIZE (TA) (log)	.9549625	1.402092	0.68	0.506
Constant	-2.10284	12.88792	-0.16	0.873
Group:4; No. of observation: 20; R squared: 0.81				

Source: Author's preparation based on panel data of the study

Table 9 shows the regression results where return on equity (ROE) is used as dependent variable and CSR disclosure is used as independent variable employing fixed effect regression model. The coefficient of CSR disclosure is positively and significantly associated with return on equity (ROE) at 10% level of significance. It indicates that higher the level of CSR disclosure higher the return on equity of Islamic Sharia-based banking companies in Bangladesh. The coefficient of age is negatively and significantly related with return on equity at 1% level of significance. It implies that older company earns less. The regression results of independent director and size (log of assets) is not statistically significantly linked with return on equity (ROE).

iii. The relationship between CSR disclosure and Earnings per share (EPS) (EPS as dependent variable)

In this section, the empirical relationship between CSR disclosure and earnings per share of Islamic Sharia-based commercial banks is investigated. To achieve the objective, the appropriate regression model for the data analysis is employed by applying Breusch-Pagan Lagrange Multiplier Test and Hausman Test. From Table 10, it is seen that the result of Breusch Pagan Lagrange Multiplier test indicates the acceptance of null hypothesis (Chi-Square value= 0.00 and P=1.00). Hausman test indicate the acceptance of alternative hypothesis i.e., fixed effect model (Chi-Square 156.46 and P=0.00).

Table 10: Showing appropriate model for the analysis

Test name	Chi-Square	Prob.	Comment
Hausman Test	156.46	0.000	Alternative accepted
Breusch-Pagan Lagrange Multiplier	0.00	1.00	Alternative rejected

Source: Author's preparation based on panel data of the study

Table 10: Regression results showing when Earnings per share (EPS) is used as dependent variables and CSR disclosure is used as independent variable in the fixed effect model

Explanatory variables	Coefficients	Std. error	t-value	p-value
CSR	.080803	.0355596	2.27	0.042
AGE	.2861946	.1225031	2.34	0.038
IDIRECTOR	-.077084	.0291647	-2.64	0.021
SIZE (TA) (log)	-1.428594	1.033916	-1.38	0.192
Constant	12.58307	10.9934	1.14	0.275
Group:4; No. of Observations: 20; R-squared:0.14, F: 6.71; Prob.: 0.0045				

Source: Author's preparation based on panel data of the study

Table 11 presents the regression results where earnings per share is used as dependent variable and CSR disclosure, age, independent director, total assets (log) are used as independent variables employing

fixed effect model. The coefficient of CSR disclosure is positively and significantly associated with dependent variable "earnings per share" at 5% level of significance (P=0.042). It implies that comprehensive reporting of

CSR information in annual reports of Islamic Sharia-based commercial banks in Bangladesh is a crucial factor in increasing earnings per share. The coefficient of age is positively associated with earnings per share in the fixed effects model at 5% level (P=0.038). The independent directors on board are negatively and significantly linked with earnings per share (EPS) at 5% level of significance in the regression model. But the

size proxied by log of total assets of Islamic Sharia-based banking companies in Bangladesh is not significantly related to earnings per share in this fixed effect model. The overall R-squared value is 0.14 indicates that the independent variables of the model can explain 14% variability of dependent variable 'earning per share'.

Table 13: Summary of the Hypotheses Tested for Hypotheses H_{a1} to H_{a3}

Hypothesis	Relationship between two variables	Expected relationship	Results		Outcome
H _{a1}	CSR on ROA	Positive	Positive	P =0.819	Rejected
H _{a2}	CSR on ROE	Positive	Positive	P =0.085	Accepted
H _{a3}	CSR on EPS	Positive	Negative	P=0.042	Accepted

Source: Author's preparation based on regression results

VI. POLICY IMPLICATIONS

The above mentioned results might have significant theoretical and practical implications. This study contributed to the existing literature in a number of ways. Firstly, the positive influence of CSR disclosure on financial performance (FP) has supported the political economy theory. It implies that Islamic banking companies should involve in social responsibility as much as possible (Freeman & Evan, 1990). Secondly, this study fills the gap in existing literature on CSR disclosure adding Bangladesh perspective on the phenomena, thereby increasing our current realization about the association between CSR reporting and FP in Islamic banking industry. Thirdly, this research has conducted in Bangladesh that is thought at now as a very emerging economy in the globe especially in the south-east sub-continent. So, the findings could have serious implications on other emerging countries in the globe. The findings of the research have exposed also some practical implications and suggestions. Firstly, the results imply that managers should increase the level of expenditure and efforts on CSR programs and they might desire a positive result on financial performance in the long-run. Secondly, Stakeholders of the company can be better aware about the policy and actions taken by the management, if they were engaged in social activities. Thus, manager should ensure accountability and fairness in managerial process and report full and relevant financial as well as non-financial information to all stakeholders.

VII. CONCLUSION

In recent years, both CSR and Islamic banking are seen in an increasing trend. Due to the significant demand of Islamic banking in this modern time, some commercial banks operate windows or sections that give Islamic banking services to clients. In this study researcher has investigated 20 annual reports of 4

Islamic Sharia-based commercial banks in Bangladesh over the period from 2011 to 2015. This research work has assessed the extent CSR reporting but mainly focused on the impact of CSR disclosure on financial performance indicators. The empirical results of Table 7 show that there is no significant association between CSR disclosure and return on assets (ROA) of Islamic Sharia-based commercial banks in Bangladesh. Regression results of Table 9 represents that there is a statistically significant association between CSR disclosure and financial performance proxied by return on equity (ROA) of Islamic Sharia-based commercial banks in Bangladesh. Hence, it can be said that higher the extent of CSR disclosure, the better the Islamic-sharia based banks financial performance in Bangladesh. The results also indicate that there is a statistically positive and significant linkage between CSR disclosure and earnings per share (EPS) of Islamic Sharia-based commercial banks in Bangladesh. So, it is an inspirational finding to them who made investment decision on the basis of earnings per share (EPS) in Islamic banking industry as higher EPS leads to the declaration of higher percentage of dividend to the investors. The findings of the study also suggest that it is advantageous to integrate CSR dimensions in Islamic Sharia-based commercial banks as business strategy. Formulation and implementation of a standard CSR policy could increase the reputation or image and assist to cope with external negative news or image – damaging incidents. Thus, it protects banks from incurring losses in the future.

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APPENDIX

Appendix-A

List of Sample Companies of the Study

S.N.	Symbolic code	Full Name of the sample banks
1	IBBL	Islami Bank Bangladesh Limited
2	SJIBL	Shajalal Islami Bank Limited
3	FSIBL	First Security Islami Bank Limited
4	ICBIBL	ICB Islami Bank Limited



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Testing for Volatility Persistence in Wheat Prices: Is Idiosyncratic Source Matters?

By Mustapha, Saidi Atanda & Yusuf, Ismaila Akanni

University of Lagos

Abstract- The paper investigates the best fit estimation technique for modeling volatility persistence in price of wheat. It further evaluates the source of rising volatility. It provides two main innovations: first, it analyzes wheat returns volatility types namely idiosyncratic and systematic volatility types and provides evidence of structural shifts in the price of wheat using the Narayan and Popp (2010) test and further modified the estimations to include both symmetric and asymmetric volatility models. Second, it uses several GARCH specifications to ascertain which of the sources of volatility generate more volatility. The paper finds two structural breaks that occur in 2015/2016 and 2018. It notices the existence of persistence and leverage effects in the returns volatility of wheat and that rising volatility regardless of types, necessitates demand for higher returns by investors to hold the investment. Conclusively, it recommends that, when modeling wheat return volatility, issues of asymmetric effects, structural shifts, and volatility persistence are very pertinent and that investors should structure investment portfolio with the knowledge that the idiosyncratic source heralds more persistence in volatility and therefore, necessitates utmost concentration.

Keywords: wheat price volatility, volatility persistence, EGARCH, and structural shifts.

GJMBR-G Classification: JEL Code: G10, G12, Q02, Q18



Strictly as per the compliance and regulations of:



Testing for Volatility Persistence in Wheat Prices: Is Idiosyncratic Source Matters?

Mustapha, Saidi Atanda ^α & Yusuf, Ismaila Akanni ^σ

Abstract- The paper investigates the best fit estimation technique for modeling volatility persistence in price of wheat. It further evaluates the source of rising volatility. It provides two main innovations: first, it analyzes wheat returns volatility types namely idiosyncratic and systematic volatility types and provides evidence of structural shifts in the price of wheat using the Narayan and Popp (2010) test and further modified the estimations to include both symmetric and asymmetric volatility models. Second, it uses several GARCH specifications to ascertain which of the sources of volatility generate more volatility. The paper finds two structural breaks that occur in 2015/2016 and 2018. It notices the existence of persistence and leverage effects in the returns volatility of wheat and that rising volatility regardless of types, necessitates demand for higher returns by investors to hold the investment. Conclusively, it recommends that, when modeling wheat return volatility, issues of asymmetric effects, structural shifts, and volatility persistence are very pertinent and that investors should structure investment portfolio with the knowledge that the idiosyncratic source heralds more persistence in volatility and therefore, necessitates utmost concentration.

Keywords: wheat price volatility, volatility persistence, EGARCH, and structural shifts.

I. INTRODUCTION

An understanding of the persistence of volatility risk in grain prices most importantly, the price of wheat is crucial to help design a sustainable strategy to hedge against the attendance effects. Studies have documented several factors that could be accountable for price increases; these include: ban of export of major grain such as corn, supply shortages, reduced stock-to-use ratios and panic buying by some major importers (Gilbert, 2010; and Minot, 2014). The long shift (decline) in the prices of wheat between 2017 and 2019 with increased volatilities (see Figure 1) have generated immense concerned for investors to search for which of the volatility sources generate the highest persistence of volatility risk. Having a better comprehension of effective modeling of price returns and volatility becomes imperative considering seasonal shifts in ptrends.

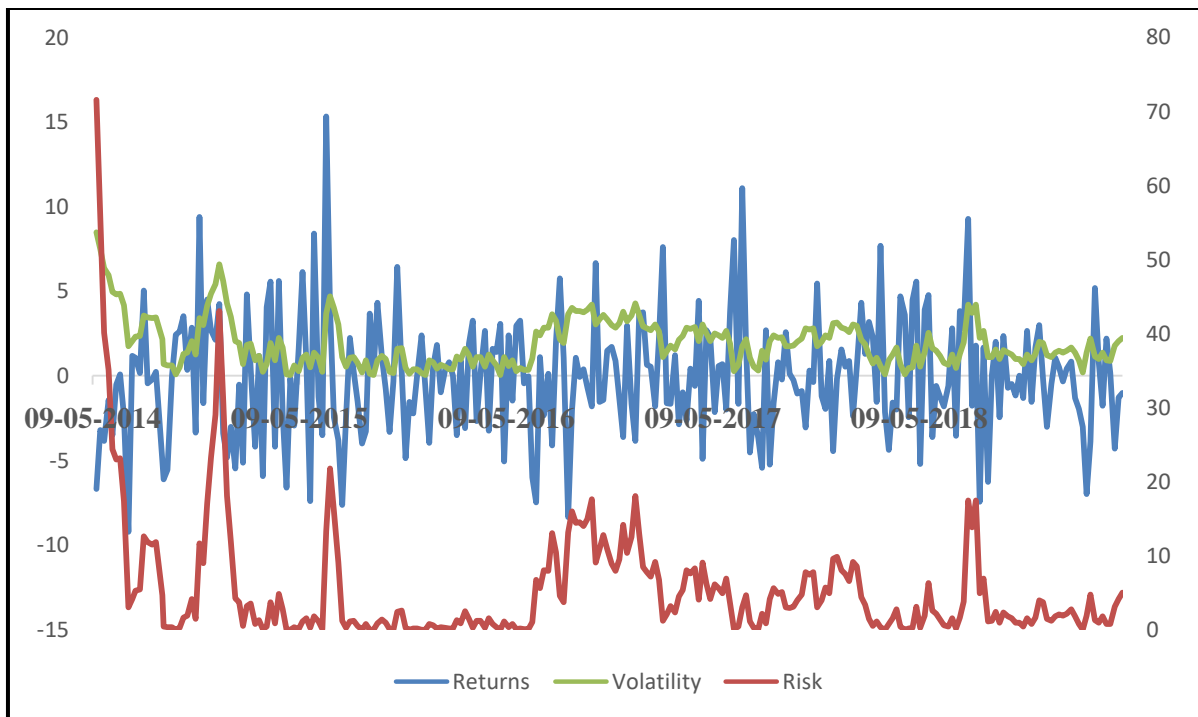
It is clear that this is not the first time that there is going to be a shift in commodity prices, specifically prices of grains. For instance, commodity prices rose rapidly between 2010 and 2011; and since 2007, global grain markets have witnessed an upward shift in price volatility. This is evident in the submission of Minot

(2014), which provide analyses of pre-during-post of the global crises. The study shows that for these periods, the unconditional volatility of grain prices rose by 52% for corn, 87% for rice and 102% for wheat, respectfully. This indicates that price of wheat produces increased upward volatility risk to investors when compared to other grains.

The paper, therefore contributes to the existing studies on commodity price volatility modeling in three folds: first, it uses the recent Narayan and Popp (2010) to model the wheat return volatility. The approach allows for structural breaks in data series. Second, the wheat return volatility analysis was performed using the volatility sources. This is an improvement to existing studies on emerging markets that had concentrated on a single source of volatility. Third, the paper considers both systematic and idiosyncratic volatility risks models. The main thrust of the paper is to identify structural breaks that occur in wheat returns; and consequently, show how intense is the volatility risk in wheat price in the international market. Our results also lend support for the consideration of the source that generates more persistence in the wheat return volatility.

Comparatively, the idiosyncratic volatility models seem more appropriate in modeling wheat return volatility than the systematic ones, as it produces more persistence in volatility risk. Most importantly, the Exponential GARCH (EGARCH) model gives the best fit and therefore, propose that when modeling wheat return volatility, the EGARCH model should be considered. The implication therefore, is that investors in wheat should expect higher returns during rising volatility regardless of types and otherwise. The rest of the paper is structured as follows. Section two presents data and methods. Section three describes the analysis of empirical results and section four concludes the paper.

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Source: Charted by Authors. Underlying data are from Bloomberg Terminal, 2019

Figure 1: Trends of Wheat Return, Risk and Volatility

II. DATA AND METHODS

The weekly wheat price data used in this study were garnered from the Bloomberg terminal throughout January 2014 and April 2019. The pre-estimation analysis is performed in two folds: the first provides descriptive statistics for wheat returns volatility considering the two types of volatilities generated – systematic and idiosyncratic volatilities; the second shows the unit root test using the NP unit root test with structural breaks. The wheat returns is computed with the formula $[\ln(P_t)/\ln(P_{t-1}) * 100]$. The systematic volatility series are obtained from the monthly standard deviation of wheat returns $[\sigma]$ and, the idiosyncratic volatility series are generated from the monthly standard deviation of the residual of the first-order Autoregressive (AR(1)) model of the form $[r_t^i = \vartheta_0 + \vartheta_1 r_{t-1}^i + \varepsilon_t^i]$.

Table 1 presents the descriptive results on wheat return volatility for both systematic and idiosyncratic volatilities. It seems evidence from the results that there are significant variations in the trends of the two volatilities. Comparatively, following the standard deviation result, the trend of the idiosyncratic volatility appears more volatile than the systematic volatility. The statistical distribution of the series, indicates that both idiosyncratic and systematic volatilities are negatively skewed which shows that there exist extreme right tails in both series. Other descriptive statistics show that wheat return volatility series are

leptokurtic (both possess fat tails than the normal distribution); the Jarque Bera statistic reveals evidence of non-normality for both systematic and idiosyncratic volatilities. Since the descriptive results show that wheat return volatilities are negatively skewed and not normally distributed, therefore, the inferential statistics that is most appropriate must follow non-normal distributions (see Wilhelmsson, 2006). The alternatives available consist of the generalized error distribution (GED), the Student-t distribution, the Student-t distribution with fixed degree of freedom and GED with fixed parameter. All these non-normality procedures are conducted for each of the volatility models and the model selection criteria are used to determine the most appropriate models. Only results that are best fit in each of the techniques is reported in the report.

Table 1: Descriptive Statistics of Volatility Series

<i>Panel A: Summary Statistics</i>						
Details	Mean	Median	StdDev	Coef.V	Skewness	JB
SVolew	0.0201	0.0203	0.0112	0.2783	-0.1045	1.0123
SVolww	0.0157	0.0184	0.0083	0.3674	-0.0827	1.0104
IVolew	0.0113	0.0146	0.0078	0.3106	-0.0549	2.0112
IVolww	0.0786	0.0073	0.0049	0.2984	-0.0378	2.0062

<i>Panel B: Correlation Statistics</i>				
	SVolew	SVolww	IVolew	IVolww
SVolew	1			
SVolww	0.8016	1		
IVolew	0.8439	0.5533	1	
IVolww	0.7155	0.7921	0.7309	1

<i>Panel C: Autocorrelation Table</i>				
	SVolew	SVolww	IVolew	IVolww
ρ_1	0.524	0.457	0.723	0.689
ρ_3	0.446	0.343	0.682	0.622
ρ_6	0.208	0.198	0.514	0.595
ρ_9	0.195	0.124	0.483	0.479
ρ_{12}	0.183	0.153	0.43	0.374

Source: Author's computation and compilation

Results of the unit root test are presented in Table 2. The estimations follow the NP test that allows for the inclusion of two structural breaks in the series. The NP test is based on two assumptions on the deterministic components. The first allows for the two breaks in the intercept of the data series, which we

tagged model 1 (M1). The second allows for two structural breaks both in levels and in slope of trend of the series. It is named model 2 (M2). Therefore, the two models are specified differently to consider for the deterministic component. The models are specified as follows:

$$d_t^{M1} = \beta_1 + \beta_2 t + \pi^*(L)[\phi_1 DU'_{1,t} + \phi_2 DU'_{2,t}] \tag{1}$$

$$d_t^{M2} = \beta_1 + \beta_2 t + \pi^*(L)[\phi_1 DU'_{1,t} + \phi_2 DU'_{2,t} + \phi_1 DT'_{1,t} + \phi_2 DT'_{2,t}] \tag{2}$$

Where

$$DU'_{i,t} = 1(t > T'_{g,i}); DT'_{i,t} = 1(t > T'_{g,i})(t - T'_{g,i}); \quad i = 1,2.$$

Also, $T'_{g,i}, i = 1,2$ denotes the true break dates. The parameters ϕ_i and $\varphi_i, i = 1,2$ are the magnitude of the level and slope breaks. $\pi^*(L)$ is the polynomial lag operator that allows breaks to occur slowly over time (see Narayan et al., 2010). The procedure follows the innovative outlier framework and it allows for changes to the trend to occur gradually rather than been instantaneous. The assumption behind the framework is

that the series reacts to shocks from the innovation process (i.e. a Moving Average representation of the shocks).

Following the assumption on the deterministic component (d_t) and stochastic component (v_t) of σ_t^{Ri} , the reduced form of the structural model of the unit roots¹ test can be specified and estimated:

$$\sigma_t^{R(M1)} = \varphi\sigma_{t-1}^R + \beta_1 * + \beta_2 * t + \theta_1 D(T'_B)_{1,t} + \theta_2 D(T'_B)_{2,t} + \lambda_1 DU'_{1,t-1} + \lambda_2 DU'_{2,t-1} + \sum_{j=1}^m \alpha_j \Delta \sigma_{t-j}^R + \varepsilon_t \tag{3}$$

$$\sigma_t^{R(M2)} = \varphi\sigma_{t-1}^R + \beta_1 ** + \beta_2 * t + \theta_1 D(T'_B)_{1,t} + \theta_2 D(T'_B)_{2,t} + \lambda_1 * DU'_{1,t-1} + \lambda_2 * DU'_{2,t-1} + \rho_1 * DT'_{1,t-1} + \rho_2 * DT'_{2,t-1} + \sum_{j=1}^m \alpha_j \Delta \sigma_{t-j}^R + \varepsilon_t \tag{4}$$

Where $D(T'_B)_{i,t} = 1(t = T'_{B,i} + 1); i = 1, 2$. In this case, to test the unit root of null hypothesis of $\varphi = 1$ against the alternative hypothesis of $\varphi < 1$. The NP test suggests the use of t-statistics of $\hat{\varphi}$ obtained after equations (3) and (4) have been estimated. The break

dates are selected using the sequential procedure proposed by the NP test and appropriate critical values as indicated in the work of Narayan et al (2010). In Table 2, the unit root test results are presented with the optimal break point dates for both volatility types.

Table 2: Unit Root Test with Two Structural Breaks

Stock Volatility Types	Model 1			Model 2		
	Test Statistic	TB1	TB2	Test Statistic	TB1	TB2
Systematic Volatility	-2.9831	04/09/2000	24/07/2008	-2.9852	04/09/2000	24/07/2008
Idiosyncratic Volatility	0.9482	05/09/2000	28/07/2008	0.9502	05/09/2000	28/07/2008

Note: Estimates are drawn from the Narayan and Popp (2010) unit root test procedure. Critical values at the 1% and 5% levels are 4.672 and 4.081. The sample ranges from 02/01/2014 to 28/04/2019.

As presented in Table 2, the two types of return volatility series are non-stationary after accounting for structural breaks and thus, adequate cognizance should be taken to recognize these breaks when dealing with wheat returns volatility modeling. Expectedly, the break dates (TB1 and TB2) for the two volatilities considered are not far apart. The first break was experienced in 2015 for both considered volatility types. Correspondingly, the second break (TB2) appears during the 2018 trading bout. In this period, the wheat market witnessed tremendous negative sentiments, rising speculations and huge divestment and the volatility risks were rising against falling wheat price trajectories.

value weighted volatility. Model selection criteria used for the selection of appropriate model of return volatility of wheat are Schwarz Information Criterion (SIC), Akaike Information Criterion (AIC) and HQC. The volatility results also present some post-estimation analyses using ARCH LM test to validate the presence of heteroscedasticity in the selected volatility estimates. The paper estimated the volatility of wheat returns through the symmetric and asymmetric models. The symmetric volatility models consist of the GARCH (1, 1) and GARCH in mean (GARCH-M (1, 1)), while the asymmetric volatility models are Threshold GARCH (TGARCH (1, 1)) and Exponential GARCH (EGARCH (1, 1)). A significant contribution of this paper as far as modeling of corn return volatility is concerned, is that it considers structural breaks. Apart from this, the volatility modeling approach adopted has made it possible to accommodate the time-varying conditional heteroscedasticity of wheat price return and also evaluate the mean-reverting property of the wheat return volatility. The mean and variance equations for the GARCH (1, 1) model are presented as follows:

III. WHEAT RETURN VOLATILITY ESTIMATES

In this section, the paper makes use of different plausible models to estimate wheat return volatility. This is conducted by considering both systematic and idiosyncratic volatility sources and consequently, the paper compares the performance of the estimations by bearing in mind varying wheat portfolios, equal and

$$\sigma_t^R = \mu + \partial \sigma_{t-1}^R + \phi_1 B_{1,t} + \phi_2 B_{2,t} + v_t \tag{5}$$

¹Check Liu and Narayan (2010) for further clarification on derivations.

Equation (5) is the mean equation and the variance equation is as follow:

$$\sigma_t^2 = \beta_0 + \beta_1 v_{t-1}^2 + \beta_2 \sigma_{t-1}^2; \quad \beta_0 > 0, \quad \beta_1 \geq 0, \quad \beta_2 \geq 0 \quad (6)$$

Where $B_{i,t} = 1$ if $t \geq TB_i$ and zero otherwise; $TB_i (i=1,2)$ represented the selected breaks (see Table 2). Note that $v_t = \sigma_t e_t$ and e_t is standard normally distributed with unit variance. The GARCH in

$$\sigma_t^R = \alpha_0 + \alpha_1 \sigma_t^2 + \alpha_2 \sigma_{t-1}^R + \varphi_1 B_1 + \varphi_2 B_2 + \varepsilon_t \quad (7)$$

As said earlier, the asymmetric volatility models considered are TGARCH (1, 1) and EGARCH (1, 1). The two models have their mean equation as shown in

$$\ln(\sigma_t^2) = \mu + \phi \left| \sqrt{v_{t-1}^2 / \sigma_{t-1}^2} \right| + \gamma \sqrt{v_{t-1}^2 / \sigma_{t-1}^2} + \pi \ln(\sigma_{t-1}^2) \quad (8)$$

The variance of the EGARCH model is specified in equation (8), while the variance of the TGARCH model is expressed as:

$$\sigma_t^2 = \delta_0 + \delta_1 v_{t-1}^2 + \delta_2 \sigma_{t-1}^2 + \varphi v_{t-1}^2 I_{t-1} \quad (9)$$

Where $I_{t-1} = 1$ if $v_{t-1} > 0$ (positive shocks) and $I_{t-1} = 0$ otherwise; and therefore, there is evidence of asymmetric effect if $\varphi < (>) 0$ which implies that positive (negative) shocks reduce the volatility of σ_t^R by more than negative (positive) shocks of the same proportion. Table 3 and 4 show the results of the several volatility models for both systematic and idiosyncratic volatility forms. The implication of the results is that, the variance process reverts to its mean slowly for all the models and irrespective of the volatility form. This is inferred from the addition of the ARCH and GARCH effects of the variance equations that are close to one, therefore indicating that the variance process reverts slowly although the systematic volatility form reverts quickly than the idiosyncratic one. The slow mean reverting process is an indication of high level of volatility persistence in the price of wheat. In this case, price of wheat with intense idiosyncratic volatility appear more persistent than that with systematic volatility. The findings are consistent with the descriptive statistics presented in Table 1.

Comparing the performance of the two volatility forms given the models, the GARCH (1, 1) model appears to produce a better fit over the GARCH in mean (GARCH-M (1, 1)) model for the symmetric volatility models. This is reached with the SIC value. This is not striking as such, as the inclusion of the coefficients on the standard deviation of the wheat price returns in the conditional mean equation, is statistically not significant and therefore, does not provide any useful information as to the volatility models (i.e. systematic and idiosyncratic models). Similarly, the estimates of

mean shows the effect of the conditional variance in the mean equation, and therefore, the mean equation is modified by including the conditional variance the return model:

equation (5) and the variance equations are specified as follows:

TGARCH (1, 1) provide an inferior result when compared to the EGARCH (1, 1) for the case of asymmetric. In all, the EGARCH (1, 1) model offers a better fit when compare to the GARCH (1, 1) in the symmetric case.

In addition, the results of the EGARCH model suggest that there are leverage effects in both volatility models – idiosyncratic and systematic volatility forms. This is inferred from the findings, as the variable measuring the leverage effects is negative for both return volatility forms. The implication therefore, is that negative shocks have tendency of reducing volatility more than positive shocks in the wheat market. It also show that investors in the wheat market react more to bad news, as bad news has immense potential of increasing volatility than good news.

In the descriptive statistics, it is evident that there is presence of ARCH effects in the return volatility series (i.e. systematic and idiosyncratic volatility); thus, necessitating the estimation of the post-estimation diagnostic tests to ascertain if the volatility models have accommodated the effects. These is the reason why the ARCH tests is conducted using both F-test and chi-square distributed (nR^2) test. The results show that in all the estimations the acceptance of the null hypothesis of no ARCH effects is appropriate. All the values are statistically not significant. Summarily, the findings show that with structural breaks in volatility series, the exponential GARCH (EGARCH (1, 1)) is superior to other GARCH variants considered in the paper. Hence, more appropriate to model volatility of wheat returns, more specifically in period of structural shifts.

Table 3: Results of Volatility Models with Structural Shifts for Systematic Case

Variable	Asymmetric Models	Symmetric Models	GARCH (1,1)	GARCH-M (1, 1)
Value Weighted Estimates	EGARCH (1, 1)	TGARCH (1, 1)	GARCH (1,1)	GARCH-M (1, 1)
Mean Equation				
Alpha	0.0041 (0.8322)	0.0005 (0.5722)	0.0002 (0.4276)	-0.0002 (-0.3081)
Beta	-0.0089 (-1.6149)	-0.0208 (-1.9803)	-0.0112 (-1.2102)	-0.0039 (-1.0527)
Delta	3.29*10 ^{^7} (3.2984)**	0.0008 (3.2097)**	0.0001 (2.7812)**	0.0003 (2.8133)**
Theta	0.0003 (0.4282)	0.0003 (0.4435)	0.0003 (0.4219)	0.0004 (0.2172)
Conditional Variance	-	-	-	0.0259 (1.0056)
Variance Equation				
Alpha	-0.2064 (-8.1508)*	4.29*10 ^{^5} (3.8923)*	4.98*10 ^{^5} (3.2091)*	4.88*10 ^{^5} (3.8730)*
Beta	-	0.0592 (6.9831)*	0.0278 (10.5470)*	0.0309 (12.7760)*
Lamda	-	0.8217 (9.0023)*	0.7437 (8.6727)*	0.8014 (10.0598)*
Phile	-	0.0049 (0.7638)	-	-
Rho	0.1472 (10.2086)*	-	-	-
Tau	-0.0142 (-2.6591)**	-	-	-
Sigma	0.7739 (5.4028)*	-	-	-
Diagnostic Statistics				
AIC	-4.9935	-4.9320	-4.9109	-4.9106
SIC	-4.8931	-4.8856	-4.9086	-4.9083
HQC	-4.8826	-4.8811	-4.9101	-4.9078
ARCH LM Test (7)				
F-Test	1.8069	1.5572	1.7209	1.7091
nR ^{^2}	1.8609	6.0982	5.8044	7.2206
No of Observation	884	884	884	884
Equal Weighted Estimates	EGARCH (1, 1)	TGARCH (1, 1)	GARCH (1,1)	GARCH-M (1, 1)
Mean Equation				
Alpha	0.0027 (0.7062)	0.0004 (0.2092)	0.0002 (0.4276)	-0.0002 (-0.3081)
Beta	-0.0089 (-1.7140)	-0.0318 (-1.2803)	-0.0112 (-1.2102)	-0.0039 (-1.0527)
Delta	2.42*10 ^{^6} (3.5491)**	0.0006 (2.9473)**	0.0001 (2.7812)**	0.0003 (2.8133)**
Theta	0.0002 (0.5009)	0.0008 (0.3851)	0.0003 (0.4219)	0.0004 (0.2172)
CVariance	-	-	-	0.0259 (1.0056)
Variance Equation				
Alpha	-0.1424 (-8.2398)*	3.11*10 ^{^6} (3.0243)*	3.88*10 ^{^6} (4.9501)*	4.32*10 ^{^6} (3.8609)*
Beta	-	0.0616 (5.1131)*	0.0678 (9.1573)*	0.0579 (10.3860)*
Lamda	-	0.5231 (7.2323)*	0.7238 (7.0085)*	0.8009 (9.1738)*
Phile	-	0.0052 (0.6447)	-	-
Rho	0.2097 (9.8160)*	-	-	-
Tau	-0.0112 (-3.0191)**	-	-	-
Sigma	0.6506 (3.9988)*	-	-	-

Diagnostic Statistics				
AIC	-4.9035	-4.9010	-4.9007	-4.9003
SIC	-4.8887	-4.8862	-4.8858	-4.8848
HQC	-4.8646	-4.8635	-4.8627	-4.8618
ARCH LM Test				
F-Test	1.7892	1.6589	1.5918	1.5904
nR ²	1.7465	5.1108	5.7345	6.2091
No of Observation	884	884	884	884

Note *, ** indicate 1% and 5% levels of significance.

Table 4: Results of Volatility Models with Structural Shifts for Idiosyncratic Case

Variable	Asymmetric Models		Symmetric Models	
Value Weighted Estimates	EGARCH (1, 1)	TGARCH (1, 1)	GARCH (1,1)	GARCH-M (1, 1)
Mean Equation				
Alpha	-0.0001 (-0.7082)	-0.0002 (-0.4278)	4.02*10 ⁻⁶ (0.2246)	0.0007 (1.1031)
Beta	0.0375 (3.1091)*	0.0402 (3.0803)*	0.0204 (3.0214)*	0.0339 (2.8793)**
Delta	0.0007 (2.2004)**	0.0005 (2.0192)**	0.0007 (2.8503)**	0.0014 (2.0103)**
Theta	0.0003 (0.5089)	0.0004 (0.7058)	0.0006 (0.6739)	0.0004 (0.6544)
Conditional Variance	-	-	-	-0.0518 (-1.1576)
Variance Equation				
Alpha	-0.2117 (-10.1218)*	5.28*10 ⁻⁵ (5.2203)*	4.58*10 ⁻⁵ (6.6201)*	4.37*10 ⁻⁵ (5.9030)*
Beta	-	0.0849 (4.1991)*	0.0583 (12.6220)*	0.0679 (15.3260)*
Lambda	-	0.7907 (9.1241)*	0.8828 (9.8932)*	0.8812 (12.1438)*
Phi	-	0.0209 (3.7855)*	-	-
Rho	0.1784 (7.0056)*	-	-	-
Tau	-0.0125 (-3.6071)*	-	-	-
Sigma	0.5639 (3.4918)*	-	-	-
Diagnostic Statistics				
AIC	-4.9735	-4.9180	-4.9310	-4.9192
SIC	-4.9383	-4.8836	-4.9196	-4.9190
HQC	-4.9306	-4.8902	-4.9275	-4.9107
ARCH LM Test				
F-Test	0.0372	0.2682	0.2147	0.3421
nR ²	0.0369	0.2676	0.2134	0.3586
No of Observation	884	884	884	884
Equal Weighted Estimates	EGARCH (1, 1)	TGARCH (1, 1)	GARCH (1,1)	GARCH M (1, 1)
Mean Equation				
Alpha	-0.0002 (-0.6983)	-0.0003 (-0.5308)	4.02*10 ⁻⁶ (0.2246)	0.0007 (1.1031)
Beta	0.0328 (3.0119)*	0.0396 (3.0874)*	0.0204 (3.0214)*	0.0339 (2.8793)**
Delta	0.0006 (2.3204)**	0.0004 (2.1196)**	0.0007 (2.8503)**	0.0014 (2.0103)**
Theta	0.0002 (0.6129)	0.0003 (0.8858)	0.0006 (0.6739)	0.0004 (0.6544)

Conditional Variance	-	-	-	-0.0518 (-1.1576)
Variance Equation				
Alpha	-0.2081 (-11.3518)*	4.54*10 ⁵ (6.4313)*	4.26*10 ⁵ (5.7207)*	4.39*10 ⁵ (6.2203)*
Beta	-	0.0887 (5.3011)*	0.0517 (10.3420)*	0.0507 (13.1173)*
Lamda	-	0.7634 (8.4081)*	0.6709 (9.5332)*	0.8055 (12.1078)*
Phile	-	0.0221 (3.8066)*	-	-
Rho	0.2008 (8.1256)*	-	-	-
Tau	-0.0137 (-3.2911)*	-	-	-
Sigma	0.4093 (3.2968)*	-	-	-
Diagnostic Statistics				
AIC	-4.9734	-4.9250	-4.9370	-4.9197
SIC	-4.9595	-4.8906	-4.9301	-4.9105
HQC	-4.9310	-4.8916	-4.9289	-4.9087
ARCH LM Test				
F-Test	0.0375	0.2656	0.2176	0.3439
nRSquared	0.0371	0.2651	0.2172	0.3508
No of Observation	884	884	884	884

Note: *, ** indicate 1% and 5% levels of significance.

IV. CONCLUDING REMARKS

Modeling volatility of wheat returns provides crucial information to investors and actors, more particularly; it reveals the level of persistence in volatility risk in the price of wheat. In essence, variability in wheat prices implies significant losses (gains) in investments and therefore, decreases (increases) returns of investors in wheat prices. As a profit maximizing investor, with a risk averse investment interest, the incidence of persistent high volatility will impact on the diversification of investor's portfolio either to a less risky assets or to more volatile asset class. Therefore, testing for persistence in wheat returns volatility has major policy relevance for investors and investors in agricultural produces.

The NP unit root test procedure shows that there are two structural breaks in wheat returns volatility. These occur in 2016 and 2018, respectively. These two seasonal shifts substantially affected wheat prices and consequently its volume of investment. The estimations show that there is persistence in the wheat returns volatility irrespective of volatility types. However, the idiosyncratic volatility type appears more persistent than systematic volatility. The results also show the evidence of leverage effects in both volatility types, and therefore, investors in wheat prices react to news differently. More importantly, the findings show that bad news has the possibility of increasing volatility in the returns of wheat prices than good news.

Furthermore, relatively, the asymmetric models seem more appropriate in modeling stock return

volatility than the symmetric approach. Particularly, the exponential GARCH (EGARCH) model produces the best fit and therefore, the paper proposes that the EGARCH should be considered when dealing with wheat return volatility modeling. In sum, the paper recommends the consideration of asymmetric effects as well as structural shifts when modeling wheat return volatility.

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Impact of Electronic Billing Machine (EBM) on Vat Compliance among Small and Medium Sized -Enterprises in Rwanda

By Jean Bosco Harelimana & Patrick Gayawira

Abstract- This study aimed at assessing the impact of Electronic billing machine on VAT compliance on Small and Medium -Size Enterprises in Rwanda. The main challenge in the administration of Value Added Tax (VAT) in many countries, has mainly been tax evasion by non-issuance of tax invoices especially by small to medium taxpayers. Electronic Billing Machines (EBMs) enable revenue authorities to monitor formal business transactions and thus offer the potential to improve VAT compliance, however, because firms can choose not to issue receipts or issue false receipts, EBMs have limited benefits to VAT collections.

Descriptive method was used to collect data, data gathered was analyzed, interpreted and presented. A sample size of 159 people grouped into Medium taxpayers, Small taxpayers and staff of RRA Musanzestation was randomly selected from a population of 709 VAT registered taxpayers located in Tax centre of Musanze. Primary and secondary data was used in this research.

Given the findings of this study, there is positive relationship between the adoption of mandatory usage of EBMs and VAT compliance indicators with a correlation coefficient of 0.586.

Keywords: *electronic billing machine (EBM), vat compliance, small and medium size enterprises.*

GJMBR-G Classification: JEL Code: M10



Strictly as per the compliance and regulations of:



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Given the findings of this study, there is positive relationship between the adoption of mandatory usage of EBMs and VAT compliance indicators with a correlation coefficient of 0.586. It was established that after the adoption of EBMs, late filing and non-filing rate of VAT has reduced by 14% and 20% respectively, timely payment of VAT liabilities has increased by 20%, reporting of sales has increased by 737 %, VAT collections were increased by 732 % and voluntary VAT registration has increased by 346 %.

To improve VAT compliance through EBMs. RRA is recommended to come up with plan integrating EBMs within broader tax compliance frameworks that create the environment which will best ensure taxpayers' voluntarily compliance.

Keywords: *electronic billing machine (EBM), vat compliance, small and medium size enterprises.*

I. INTRODUCTION

Generally, the rationale for imposing taxes in any country is derived from the government responsibilities of providing social and economic goods and services such as public goods, redistribution of income and wealth, social and economic welfare, and economic stability (Herman *et al.*, 2017).

The primary mission of the tax administration is to collect the tax revenues due and needed by the government, under the country's tax laws, without hindering economic activity. In pursuing their mission, tax administrations face a number of challenges,

including how to broaden the tax base by continually bringing non-registrants and non-filers into compliance, strengthening organization and management, controlling tax evasion, improving tax collection, and facilitating voluntary compliance. The greatest challenge for any tax administration is achieving and maintaining a high degree of voluntary compliance (Peter and Patricia, 2015).

Improving VAT compliance is one of the most critical issues for domestic revenue mobilization in developing countries for two reasons: Firstly, VAT revenues tend to dwarf all other tax revenue streams, so that even small improvements have relatively large impacts. Secondly, the data generated to observe VAT liability generates a paper-trail that strengthens a revenue authority's ability to enforce tax compliance across all domestic tax types (IGC, 2017).

Many governments around the world have recently introduced Electronic Billing Machine (EBM). These devices aim to combat non-compliance with VAT by monitoring business transactions (IGC, 2017). A good tax collection system is based on the recording of all transactions that are subject to taxation, sometimes via the use of electronic devices that would prevent eluding the State's interests and committing fiscal fraud (Bostan and Popescu, 2017).

In the context of worldwide the first to use Electronic Fiscal Device (EFD) was the Italian administration in 1983. The Greek tax agency was the next tax administration to adopt fiscal devices in 1988 (Peter and Patricia, 2015). Kenya was the first adopter in Sub-Saharan Africa in 2005, and since then many others have followed including Tanzania, Ethiopia and most recently Rwanda and Malawi. South Korea has extended the scope of EFDs to all business. EFDs have therefore been an important and influential policy (IGC, 2017). The Table 1 presents an overview of the roll-out of EFDs for a selection of countries:

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Table 1: Overview of the roll-out of EFDs for a selection of countries

Country	Year	Type of EFD	Scope
First Generation			
Greece	1988	SDC	All VAT registered
Bulgaria	1993	SDC	All VAT registered
Moldova	1993	SDC	All VAT registered
Brazil (State level)	1994	SDC	All Sales Tax registered
Argentina	1995	SDC	All VAT registered
Romania	2000	SDC	All VAT registered
Mexico	2000	SDC	All VAT registered
Montenegro	2001	SDC	All VAT registered
Second Generation			
South Korea	2005	SDC + GPRS	All businesses
Paraguay	2008	SDC + GPRS	Sector VAT registered
Sweden	2010	SDC + GPRS	All VAT registered
Third Generation			
Chile	2003	SDC + GPRS + CIS	All VAT registered
Kenya	2005	SDC + GPRS + CIS	All VAT registered
Ethiopia	2008	SDC + GPRS + CIS	All VAT registered
Dominican Republic	2009	SDC + GPRS + CIS	All VAT registered
Tanzania	2010	SDC + GPRS + CIS	All VAT registered
Kosovo	2012	SDC + GPRS + CIS	All VAT registered
Panama	2012	SDC + GPRS + CIS	All VAT registered
Rwanda	2013	SDC + GPRS + CIS	All VAT registered
Hungary	2014	SDC + GPRS + CIS	All VAT registered
Malawi	2015	SDC + GPRS + CIS	All VAT registered

Source: Adapted from Casey and Castro, 2015.

In August 2013, Rwanda adopted a new law that stated that all businesses registered for VAT must provide customers, at each sale, a certified VAT receipt generated by a third-generation EFD: the Electronic Billing Machine, which contains a Sales Data Controller (SDC) with GPRS and a Certified Invoicing System (CIS) all working together. This must be purchased from a Rwanda Revenue Authority (RRA)-approved vendor and activated by the RRA (IGC, 2017). The findings of the study of Internal Growth Center in Rwanda showed that on average, the introduction of EBMs resulted in a VAT increase of 5.4 percent. This was relatively little, and much lower than expected by the Rwandan Revenue Authority (IGC, 2017).

Tanzania Revenue Authority (TRA) has recorded an increase in Value Added Tax (VAT) under the use of EFDs. Despite the fact that the revenue collection has increased following the introduction of the EFDs, the system is lacking support from business operators in the country-raising unsolved grievance between business operators regarding the use of EFDs. All over the country business operators have been conducting several demonstrations and/or strikes to oppose the use of FEDs. The users of these devices has been complained for the high cost of obtaining them, insecurity which leads to the lack of trust and other financial reasons (Mohammed, 2014).

The introduction of fiscal devices presents opportunities for the tax administration to rethink its approach to business processes, not only by automating the collection of information, but also by leveraging the new arrangements to improve compliance approaches and strategies. Another area affecting the use and deployment of EFDs is the constant evolution of the technology involved, both in terms of cost reduction and improved performance of the devices. The emergence of new technologies is a constant challenge to established views on fiscal devices. Several countries approached for the survey indicated that after studying the effectiveness, costs, and administrative requirements of EFDs, they had decided that other technologies, in particular e-invoicing, would be more cost-effective (Peter and Patricia, 2015).

Another key conclusion of many researchers the introduction of EFDs requires considerable effort and is accompanied by associated costs both to the administration in identifying the technology, selecting the devices, overseeing their deployment. Once the devices are chosen and available, it is essential that appropriate arrangements be put in place for their installation, support, and maintenance. Proper consideration of these factors is essential for a successful implementation. Moreover, EFDs appear to

suffer from similar challenges as other regimes if there are no effective follow-up and enforcement measures. Absent effective compliance monitoring and enforcement, overall VAT compliance cannot be improved, with or without EFDs .

II. OBJECTIVES

The general objective of this study is to analyze the contribution of electronic billing machine (EBM) on VAT compliance on small and medium -size enterprises in Rwanda. Specifically:

1. To determine the level of compliance activities namely tax education, frequency of audit and tax advisory visits, on VAT compliance.
2. To assess the impact of the adoption of EBM on VAT compliance.
3. To establish measures to improve the use of EBM in enhancement of VAT compliance.

III. LITERATURE REVIEW

Trivediet *al.* (2005) explain the reason why taxpayers comply by two classes of theories. First, the economic based theories, which emphasize incentives. This theory suggests that taxpayer “play audit lottery”. They make calculation of the economic consequences of different compliance alternatives (such as whether to or not to evade tax), the probabilities of detection and the consequences there of, and then choose the alternative for the desired level of risk. In contrast, the second class of theories assumes that psychological factors including moral and ethical concerns are also important to taxpayers and so taxpayers may comply even where the risk of audit is low. Economic theories generally call for increased audit and penalties as the solution to compliance. However, the policy prescription of psychological theories leads to emphasize on changing individuals attitude towards the tax system by increasing its perceived fairness and making it easy to comply with the tax law through such measures as superior website information, increased telephone assistance and appropriate information technology.

The impact of fines on tax compliance do not provide a clear picture on the relation between fines and tax compliance (Fischer *et al.*, 1992). Keeping constant the expected value of a tax but changing audit probabilities and fines for non-compliance, it showed that compliance increased significantly with higher fines, but not with higher audit probabilities. Punitive penalties makes tax evasion more costly for the taxpayer hence leading to the reduction of tax evasion. Research studies show that more punitive fines and penalties can result in more tax avoidance (Kirchler, 2007). Deterrence is effective when there is a combination of effective imposition of fines and frequent audits to detect cases of noncompliance.

Mascagni *et al.*, (2016) found that sending a ‘reminder’ by either letter, email or text message, of a firm’s upcoming tax obligations all had a strong and significant effect on firms’ payment of Corporate Income Tax. Applying such an approach to EBM receipt issuing could offer a powerful means to improve EBM receipt issuing compliance. Any such an intervention will require the establishment of a strong data analytics programme, which can reliably identify ‘irregular’ patterns of receipt issuing. On this basis, it could send out automated text messages to firms to ‘remind’ them of suspicious behaviour. For instance, taxpayers could be informed that the revenue authority has noticed a large drop in receipt issuing and requested to clarify if there is anything wrong with the EBM device; it could be asked for a voluntary quarterly VAT revision based on suspicious tax declarations (fake receipts) or suspicious price patterns.

In his study, Wanjiku (2011) did a study on the impact of ETRs on the duration of VAT audit in Kenya. This study findings indicate that the use of ETRs contribute significantly in reducing the VAT audit time in the studied population in Kenya (Wanjiku, 2011).The research findings suggest that the use of ETRs machines among VAT registered taxpayers in the study areas does indeed contribute in a positive and significant way to improving the compliance attitude and efficient tax administration in the study area.

Chenge (2010) conducted a study on the impact of ETR on VAT compliance among classified hotels found in the capital, Nairobi. He found out that the introduction of these machines result in the VAT compliance level through increasing the level of declared VAT liability among the studied classified hotels (Chenge, 2010).

Ikasu (2014) studied the challenges facing the implementation of using EFD in tax collection in Tanzania. The major findings of the study were; it had been indicated that EFD system had a lot of challenges which hinder the implementation of using the machine though the system enhanced tax collection in business premises in Tanzania. Those challenges include regular break down, fairness of tax estimated from tax payers, lack of education on the use of EFDs machines, maintenance of machines and under pricing of tax from traders.

Current trends in tax administration modernization suggest there may be more effective ways to achieve voluntary compliance, particularly through the adoption of compliance improvement models. It is clear that technology in and of itself will not change behavior. The implementation of EFDs can only be effective if it is a part of a comprehensive compliance improvement strategy that clearly identifies risks for the different segments of taxpayers and envisages implementing a set of measures to mitigate these risks. The deployment of fiscal devices alone cannot by itself

achieve meaningful results, whether in terms of revenue gains or permanent compliance improvements. Another key conclusion from many studies is that the introduction of EFDs requires considerable effort, accompanied by associated costs both to the administration and to the affected taxpayers in addressing the requirements of the new rules. Once the devices are chosen and available, it is essential that appropriate arrangements be put in place for their installation, support, and maintenance. Studies showed that, when these arrangements were not in place or were incomplete, the implementation of EFDs faced considerable problems. Proper consideration of these factors is essential for a successful implementation. Moreover EFDs appear to suffer from similar challenges as other regimes if there are no effective follow-up and enforcement measures. Absent effective compliance monitoring and enforcement, overall VAT compliance cannot be improved, with or without EFDs (Peter and Patricia, 2015).

IV. METHODOLOGY

This section describes the methodology that was used in the study.

a) Research design

This study adopted a descriptive survey. Descriptive survey research design is a scientific method which involved observing and describing the behavior of a subject without influencing it in any way (Cooper & Schindler, 2008). It employed both quantitative and qualitative approaches. The study engaged a descriptive, cross sectional and correlational research designs. It engaged correlation design to establish the relationship between electronic billing machine (EBM) and VAT compliance on small and medium -size enterprises in Rwanda.

Table 2: Number of taxpayers according to their categories

Group	Total taxpayers	Sample
Small taxpayers	688	154
Medium taxpayers	21	5
Total	709	159

Source: Primary data, 2018

The table 2 shows the number of taxpayers according to their categories, 245 are small taxpayers, 281 medium taxpayers and 183 large taxpayers. Then for every categories there are some persons means sample which was taken to represent every categories, for small taxpayers is 55, 63 for medium taxpayers and 41 for large taxpayers.

c) Research Instruments

In this research two main sources of information will be used; these are primary and secondary data.

b) Population and sampling techniques

The population in this study will limit to 709 who are taxpayers and staffs of RRA Musanze tax station, Musanze Branch irrespective of structure, age, sex and any other conditions. The target population was taxpayers of RRA Musanze station.

In this research, the sample has been calculated by using the formula of Slovin, with confidence level of 93% and a permissible error of 7%. The sample size for this study has been determined using the formula of (Slovin, 1960). The formula is used to calculate the sample size (n) given the population size (N) and a margin of $n = \frac{N}{(1+Ne^2)}$.

Error (e). It is computed as:

In this research N= 709 taking the confidence level of 93% that is with a permissible error of 7%, e=0.07. Therefore, the sample size was calculated as the following;

$$n = \frac{N}{(1 + Ne^2)} = \frac{709}{1 + (709 * 0.07^2)} = 158.6 \cong 159 \text{ respondents}$$

The size of the corrected sample was equal to 159 respondents to present 709 entire population, are VAT traders register and RRA Musanze staff.

➤ Sampling frame

The sampling frame is any material or device used to obtain observational access to the finite population of interest. It must be possible with the aid of the frame to identify and establish contact with selected elements either by telephone, visit, questionnaire, etc. (Kakooza, 1996). The sampling frame is comprehensive list of all the sampling units from which a sample can be selected.

➤ Questionnaires

For this study, both open and closed ended questions were used and addressed to respondents.

The questionnaire has been addressed to a sample of taxpayers registered in VAT Musanze station where a member responded the question pre-prepared.

➤ Interview

In this study, semi structured interview was used to the staff of RRA Musanze station that they have freely expressed their views and objectively.

➤ Documentation

Documentary technique has enabled the researcher to collect data from different sources of secondary data: RRA reports, thesis of the other researcher related to our study.

d) Validity and reliability

Validity helped to ensure that the questionnaires represented the content, they were appropriate for the sample and that the questionnaires were comprehensive enough to collect all the information needed to address the purpose and goals of the study. Test-re-test method was used. During the study, a randomly selected sample of proprietors of RRA's was given questionnaires to fill.

e) Ethical Considerations

This research endeavored to obtain an informed consent from the respondents before undertaking to collect data from the field. Objectives of the research

were explained and made known to the respondents so as to solicit their informed consent. High level of confidentiality on the information provided by respondents through interview or questionnaires was maintained.

V. RESULTS DISCUSSION

The following tables shows the results obtained through the survey conducted on tax payers Musanze station.

a) Impact of mandatory usage of EBM on VAT compliance

This part is composed of results obtained on mandatory usage of EBM on VAT compliance indicators namely timely filing of VAT returns, timely payment of VAT liabilities, accurate reporting in VAT declaration and voluntary VAT registration .

Table 3: Impact of EBM on timely filing of VAT declaration after the adoption of EBM

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid strongly agree	119	74.8	74.8	74.8
Agree	29	18.2	18.2	93.1
strongly disagree	6	3.8	3.8	96.9
Disagree	5	3.1	3.1	100.0
Total	159	100.0	100.0	

Source: Primary data, 2019

According to the results in table above, which shows the impact of EBM on timely filing of VAT declaration after the adoption of EBM, 74.8% of all respondents strongly agree with the positive impact of EBM on timely filing of VAT after the adoption of EBM, 18.2% agree and other 3.8% strongly disagree and that

means 3.1% of all respondents disagree with the positive impact of EBM on timely filing of VAT declaration after the adoption of EBM. There is positive impact of EBM on timely filing of VAT declaration after the adoption of EBM.

Table 4: Impact of EBM on timely payment of VAT liabilities after the adoption of EBM

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	126	79.2	79.2	79.2
Agree	21	13.2	13.2	92.5
Strongly disagree	3	1.9	1.9	94.3
Disagree	9	5.7	5.7	100.0
Total	159	100.0	100.0	

Source: Primary data, 2019

According to the results in table above, which shows the impact of EBM on timely payment of VAT declaration after the adoption of EBM, 79.2% of all respondents strongly agree with the positive impact of EBM on timely payment of VAT liabilities after the adoption of EBM, 13.2% agree and other 1.9% strongly disagree the last one means 5.7% of all respondents disagree with the positive impact of EBM on timely payment of VAT liabilities after the adoption of EBM.

Means that the adoptions of EBM have a strong positive impact on VAT liabilities.

Table 5: Impact of EBM on reporting of VAT sales after the adoption of EBM

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	127	79.9	79.9	79.9
Valid Agree	16	10.1	10.1	89.9
Valid Strongly disagree	8	5.0	5.0	95.0
Valid Disagree	8	5.0	5.0	100.0
Total	159	100.0	100.0	

Source: Primary data, 2019

Through the results obtained in the table, 79.9% of all respondents strongly agree that there is a positive impact of EBM on reporting of VAT sales after the adoption of EBM, 10.1% agree, 5.0% strongly disagree

and other 5.0% of all respondents disagree. These results explain that there positive impact of EBM on reporting VAT sales after the adoption of EBM.

Table 6: Impact of EBM on VAT collected by RRA after the adoption of EBM

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	108	67.9	67.9	67.9
Valid Agree	46	28.9	28.9	96.9
Valid Strongly disagree	3	1.9	1.9	98.7
Valid Disagree	2	1.3	1.3	100.0
Total	159	100.0	100.0	

Source: Primary data, 2019

Table 10 shows that 67.9% of all respondents strongly agree with positive impact of EBM on VAT paid after the adoption of EBM, 28.9% Agree with that, 1.9% strongly disagree and only 1.3% disagree with the

positive impact of EBM on VAT paid after the adoption of EBM. This result confirmed that there is positive impact of EBM on VAT paid after the adoption of EBM.

Table 7: Impact of EBM on voluntary VAT registration after the adoption of EBM

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	111	69.8	69.8	69.8
Valid Agree	16	10.1	10.1	79.9
Valid Strongly disagree	24	15.1	15.1	95.0
Valid Disagree	8	5.0	5.0	100.0
Total	159	100.0	100.0	

Source: Primary data, 2019

Table 11 shows the impact of EBM on voluntary VAT registration after the adoption of EBM; 69.8% of all respondents strongly agree with the positive impact of EBM on voluntary VAT registration after the adoption of EBM, 10.1% agree, 15.1% strongly disagree and 5% disagree with the positive impact of EBM on VAT registration after the adoption of EBM. This result confirmed that there is strongly relationship between impact of EBM on VAT registration before and after the adoption of EBM.

compliance indicators namely audit, Tax education and Tax advisory visits. The results have obtained through to the survey conducted by researcher on the taxpayers of Musanze station.

➤ Tax audits

Some studies claimed that audits have a positive impact on tax evasions (Dubin, 2004). These findings suggest that in self-assessment systems, tax audits can play an indispensable role and their essential role is to increase voluntary compliance. Frequencies and meticulousness of audits could encourage taxpayers to be more prudent in completing their tax returns, reporting all income and claiming the correct deductions to ascertain their tax liability. In contrast,

b) The impact other compliance activities conducted by RRA on VAT compliance

The part below shows the impact of other compliance activities conducted by RRA on VAT

taxpayers who have never been audited might be tempted to under report their actual income and claim false deductions.

Table 8: Impact of audit on accurate reporting of information in VAT declaration

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	95	59.7	59.7
	Agree	16	10.1	69.8
	Strongly disagree	32	20.1	89.9
	Disagree	16	10.1	100.0
	Total	159	100.0	100.0

Source: Primary data, 2019

Table 12 shows the impact of audit on accurate reporting of information in VAT declaration, 59.7% strongly agree with the positive impact of audit on accurate reporting in VAT declaration, 10.1% agree, 20.1% strongly disagree and 10.1% of all respondents disagree with the positive impact of audit on accurate reporting of information in VAT declaration.

Table 9: Impact of audit on timely payment of VAT liabilities

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	8	5.0	5.0
	Agree	16	10.1	15.1
	Strongly disagree	127	79.9	95.0
	Disagree	8	5.0	100.0
	Total	159	100.0	100.0

Source: Primary data, 2018

Table 13 shows the impact of audit on timely payment of VAT liabilities, 79.9% of all respondents strongly disagree with the impact of audit on timely payment of VAT liabilities, 10.1% agree, and 5.0% of all respondents strongly agree and other means 5.0% of all respondents disagree. These results confirmed that there is no relationship between the impact of audit on timely payment of VAT liabilities.

Table 10: Impact of audits on timely of filing of VAT declaration

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	16	10.1	10.1
	Agree	8	5.0	15.1
	Strongly disagree	127	79.9	95.0
	Disagree	8	5.0	100.0
	Total	159	100.0	100.0

Source: Primary data, 2018

Table 14 shows the impact of audit on timely filing of VAT declaration, 79.9% of all respondents strongly disagree with the impact of audit on timely filing of VAT declaration, 10.1% strongly agree, 5% of all respondents agree and 5% disagree. These results confirmed that there is no relationship between the impact of audit and on timely filing of VAT declaration.

Table 11: Impact of audit on voluntary VAT registration

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	5	3.1	3.1	3.1
Valid Agree	11	6.9	6.9	10.1
Valid Strongly disagree	127	79.9	79.9	89.9
Valid Disagree	16	10.1	10.1	100.0
Total	159	100.0	100.0	

Source: Primary data, 2018

The table 15 shows, the impact of audit on voluntary VAT registration, then 3.1% strongly agree with the impact of audit on voluntary VAT registration, 6.9% agree, 79.9% strongly disagree and 10.1% disagree on the impact of audit on voluntary VAT registration. These results explain clearly that there is no relationship between the impact of audit and voluntary VAT registration.

i. Education

Previous literature supports the direct, positive relationship between educational level and taxpayer compliance (Jackson and Miliron, 1986). Chan *et al.*

(2000), also postulate that education level is directly linked to a likelihood of compliance. Educated taxpayers may be aware of noncompliance opportunities, but their potentially better understanding of the tax system and higher level of moral development promote a more favourable taxpayer attitude and greater compliance. The influence of tax knowledge on compliance behaviour has been described in various researches. The level of education received by taxpayers is an important factor that contributes to the understanding about taxation especially regarding the laws and regulations of taxation (Eriksen and Fallan, 1996).

Table 12: Impact of tax education on accurate reporting of information in VAT declaration

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	95	59.7	59.7	59.7
Valid Agree	32	20.1	20.1	79.9
Valid Strongly disagree	11	6.9	6.9	86.8
Valid Disagree	21	13.2	13.2	100.0
Total	159	100.0	100.0	

Source: Primary data, 2018

The table 16 shows that 59.7% of all respondents strongly agree on the positive impact of tax education on accurate reporting of information in VAT declaration, 20.1% agree, 6.9% strongly disagree and 13.2% of all respondents disagree on the positive

impact of tax education on accurate reporting of information in VAT declaration. The results obtained confirmed that there is positive relationship between the impacts of tax education on accurate reporting of information in VAT declaration.

Table 13: Impact of tax education on timely payment of VAT liabilities

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	92	57.9	57.9	57.9
Valid Agree	35	22.0	22.0	79.9
Valid Strongly disagree	10	6.3	6.3	86.2
Valid Disagree	22	13.8	13.8	100.0
Total	159	100.0	100.0	

Source: Primary data, 2018

Table 17 shows the results of respondents on the positive impact of tax education on timely payment of VAT liabilities, 57.9% strongly agree, 22% agree, 6.3% strongly disagree and 13.8% of all respondents disagree

on the positive impact of tax education on timely payment of VAT declaration.

Table 14: Impact of tax education on timely of filing of VAT declaration

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	87	54.7	54.7
	Agree	41	25.8	80.5
	Strongly disagree	6	3.8	84.3
	Disagree	25	15.7	100.0
	Total	159	100.0	100.0

Source: Primary data, 2018

Table 18 shows that 54.7% of all respondents strongly agree with the positive impact of tax education on timely of filing of VAT declaration, 25.8% agree, 3.8% strongly disagree and 15.7% of all respondents

disagree on the positive impact of audit tax education on timely filing of VAT declaration. These results mean that there is strong positive relationship between tax education and timely of filing of VAT declaration.

Table 15: Impact of tax education on voluntary VAT registration

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	108	67.9	67.9
	Agree	32	20.1	88.1
	Strongly disagree	6	3.8	91.8
	Disagree	13	8.2	100.0
	Total	159	100.0	100.0

Source: Primary data, 2018

According to the results in the table 19, 67.9% of all respondents strongly agree with the positive impact of tax education on voluntary VAT registration, 20.1% agree, 3.8% strongly disagree and 8.2% of all respondents disagree with the positive impact of tax education on voluntary VAT registration. This means that there is positive impact of tax education on VAT registration.

ii. *Role (efficiency) of the tax authority/government*

For many aspects of tax compliance, there is a debate in literature as to how the effective operation of the tax system by the tax authorities influences

taxpayers' compliance behaviour. The role of the tax authority in minimizing the tax gap and increasing voluntary compliance is clearly very important. Hasseldine and Li (1999) illustrated tax compliance is placing the government and the tax authority as the main party that need to be continuously efficient in administering the tax system in order to curtail tax evasion. Besides, the study of Richardson (2008) also suggested that the role of a government has a significant positive impact on determining attitudes toward tax.

Table 16: Impact of tax advisory visits on accurate reporting of information in VAT declaration

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	100	62.9	62.9
	Agree	37	23.3	86.2
	Strongly disagree	6	3.8	89.9
	Disagree	16	10.1	100.0
	Total	159	100.0	100.0

Source: Primary data, 2017

For the table which shows the results on the impact of tax advisory visits on accurate reporting of information in VAT declaration, 62.9% of all respondents strongly agree, 23.3% agree, 3.8% strongly disagree and 10.1% of all respondents were agree. This results

shows that there is positive impact of tax advisory visits on accurate reporting of information in VAT declaration.

Table 17: Impact of tax advisory visits on timely payment of VAT liabilities

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	37	23.3	23.3	23.3
Agree	39	24.5	24.5	47.8
Strongly disagree	16	10.1	10.1	57.9
Disagree	67	42.1	42.1	100.0
Total	159	100.0	100.0	

Source: Primary data, 2018

According to the results in the table 21, 23.3% of all respondents strongly agree with the impact of tax advisory visits on timely payment of VAT declaration, 24.5% were agree, 10.1% strongly disagree and 42.1% of all respondents disagree with the impact of tax advisory visits on timely payment of VAT liabilities. This means that there is no impact of tax advisory visits on timely payment of VAT declaration.

Table 20: Impact of tax advisory visits on timely of filing of VAT declaration

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	32	20.1	20.1	20.1
Agree	40	25.2	25.2	45.3
Strongly disagree	24	15.1	15.1	60.4
Disagree	63	39.6	39.6	100.0
Total	159	100.0	100.0	

Source: Primary data, 2018

For the table 22 which shows the results on the impact of audit tax advisory visits on timely of filling of VAT declaration, 20.1% of all respondents strongly agree, 25.2% agree, 15.1% strongly disagree and 39.6% of all respondents disagree with the impact of audit tax advisory of filing of VAT declaration. This means that there is no impact of audit tax advisory visits on timely of filing of VAT declaration.

Table 21: Impact of tax advisory visits on voluntaryVAT registration

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	100	62.9	62.9	62.9
Agree	37	23.3	23.3	86.2
Strongly disagree	6	3.8	3.8	89.9
Disagree	16	10.1	10.1	100.0
Total	159	100.0	100.0	

Source: Primary data, 2018

The table 23 shows the impact of tax advisory on voluntary VAT registration, 62.9% of all respondents strongly agree with the positive impact of tax advisory visits on voluntary VAT registration, 23.3% agree, 3.8% strongly disagree and 10.1% of respondents disagree with the positive impact of tax advisory visits on voluntary VAT registration. These results explain that there is positive relationship between tax advisory visits and voluntary VAT registration.

filing and payment rates of VAT declaration before and after the adoption of EBM .

c) *Statistics of RRA Musanze station in relation to objectives of the study*

The part below is composed of statistics of RRA Musanze station on number of voluntary VAT registration before and after the adoption of EBM, sales declared and VAT collected before and after the adoption of EBM,

Table 22: Number of voluntary VAT registration before and after the adoption of EBM

N°	YEAR	Number vat registered taxpayers	
1	2010	148	BEFORE
2	2011	283	
3	2012	301	
4	2013	350	
5	2014	432	AFTER
6	2015	499	
7	2016	523	
8	2017	661	

Source: Secondary data, 2017

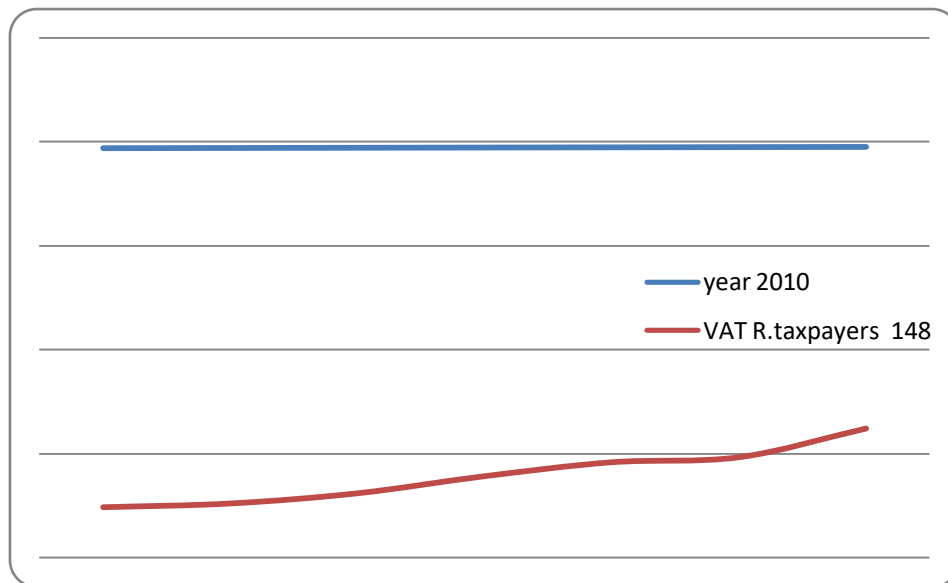


Figure 3: Statistics of voluntary VAT registration before and after the adoption of EBM

Figure 3 shows how the EBM have positive impact on the VAT taxpayers registered, before the adoption of EBM means from 2010 up to 2013 the total number of taxpayers registered was 1082 taxpayers

while after the adoption of EBM the number of taxpayers was increasing. The total number of taxpayers from 2014 up to 2017 was 2115 taxpayers who were registered.

Table 23: VAT sales declared and VAT collections before and after the adoption of EBM

N°	Year	Annual sales declared	VAT collected	
1	2010	8,695,712,436	249,870,919	BEFORE
2	2011	17,928,313,102	418,758,690	
3	2012	23,112,614,685	475,606,998	
4	2013	28,550,951,623	1,479,780,990	
5	2014	32,475,180,057	1,523,357,813	AFTER
6	2015	45,183,565,134	1,349,195,453	
7	2016	51,369,499,239	1,657,830,866	
8	2017	67,086,778,494	2,073,708,020	

Source: RRA Musanze station, 2017

Table 25, shows the annual turnover declared and VAT due paid in Musanze before and after the adoption of EBM (from 2010 up 2017).

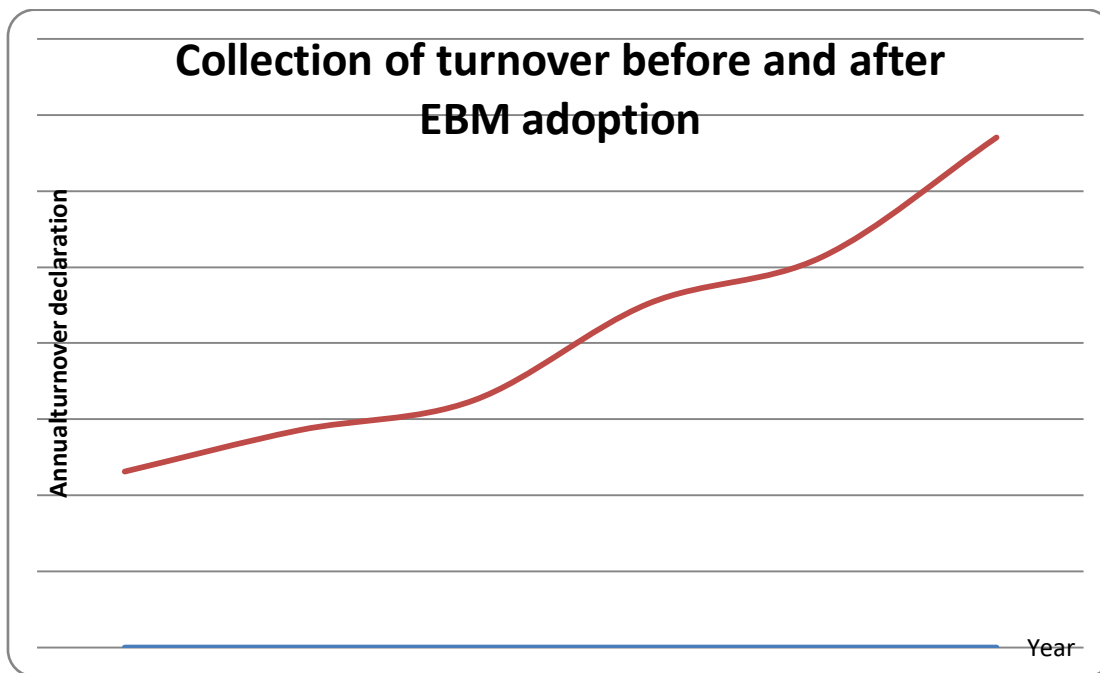


Figure 4: Trend of VAT turnovers declared before and after the adoption of EBM

This figure shows the collection of annual turnover before and after the adoption of EBM, the results fund after the analysis was shows that there is big difference between the annual turnover collected before and after the adoption of EBM. From 2010 up to 2013, the total annual turnover of those years was 78,287,591,846 Rwf while from 2014 up to 2017 after the adoption of EBM the total annual turnover was 196,115,022,924 Rwf, these total turnover shows that there is higher difference between the turnover collected before the adoption of EBM means 78,287,591,846 Rwf and the total turnover after the adoption of EBM which is 196,115,022,924 Rwf. The results of this study agree with the study conducted by Machogu and Amayi (2013) which is state that the adoption of EBM have positive impact on the annual turnover collected. Other compliance indicators are; percentage of income that is reported for the taxation purposes and the programme impact indicator. Here, one may assess the impact of specific programmes or initiatives on the VAT compliance as well as behaviour of the target taxpayer population (Machogu and Amayi, 2013).



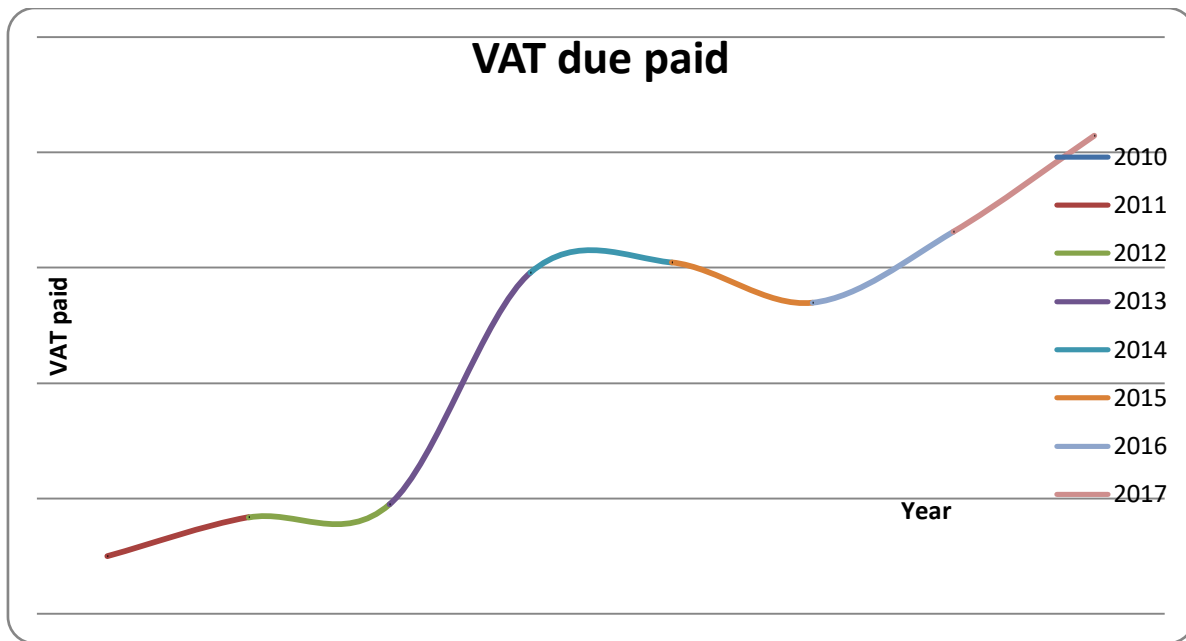


Figure 5: Trend of VAT collected before and after EBM adoption

This figure 4 shows the collection of VAT paid before and after EBM adoption, the results fund after the analysis was shows that there is big difference between the VAT paid before and after EBM adoption. From 2010 up to 2013, the total annual turnover of those years was 2,624,017,597Rwfs while from 2014 up to 2017 after the adoption of EBM the total VAT paid was

6,604,092,152Rwfs, these total VAT paid shows that there is difference between the VAT paid before the adoption of EBM means 2,624,017,597Rwfs and the total VAT collected after the adoption of EBM which is 6,604,092,152 Rwfs. The adoption of EBM has positive impact on the VAT collected.

Table 24: Statistics on filing rates of VAT declarations before and after the adoption of EBM at Musanze station

BEFORE				
N°	Year	On time filing rate	Late filing rate	Non filing rate
1	2010	57.8%	18.4%	23.9%
2	2011	69.6%	13.6%	16.8%
3	2012	58.6%	5.8%	35.5%
4	2013	66.9%	7.7%	25.4%
AFTER				
5	2014	69.8%	7.4%	22.5%
6	2015	77.1%	8.4%	14.6%
7	2016	85.8%	6.8%	7.4%
8	2017	87.1%	3.9%	9.0%

Source: RRA Musanze station, 2017

The table 26 shows the statistics of number of timely filing of VAT before and after the adoption of EBM at Musanze station. Then the results obtained through to the secondary data of RRA musanze station confirmed that from 2010 to 2011 there is increasing on time filing rate means 57.8% to 69.6%, from 2012 to 2013 there an increasing on time filing rate means 66.9% to 69.8% . we know that the adoption of EBM was begin in 2013 this

results shows that after the adoption of EBM there is increasing on time filing rate while for rate filing there is a decreasing of rate filing means 18.4% in 2010 to 3.9% in 2017. For non filing rate there is also decreasing from 23.9% in 2010 to 9.0% in 2017, this decreasing confirmed the positive impact of EBM adoption on timely filing.

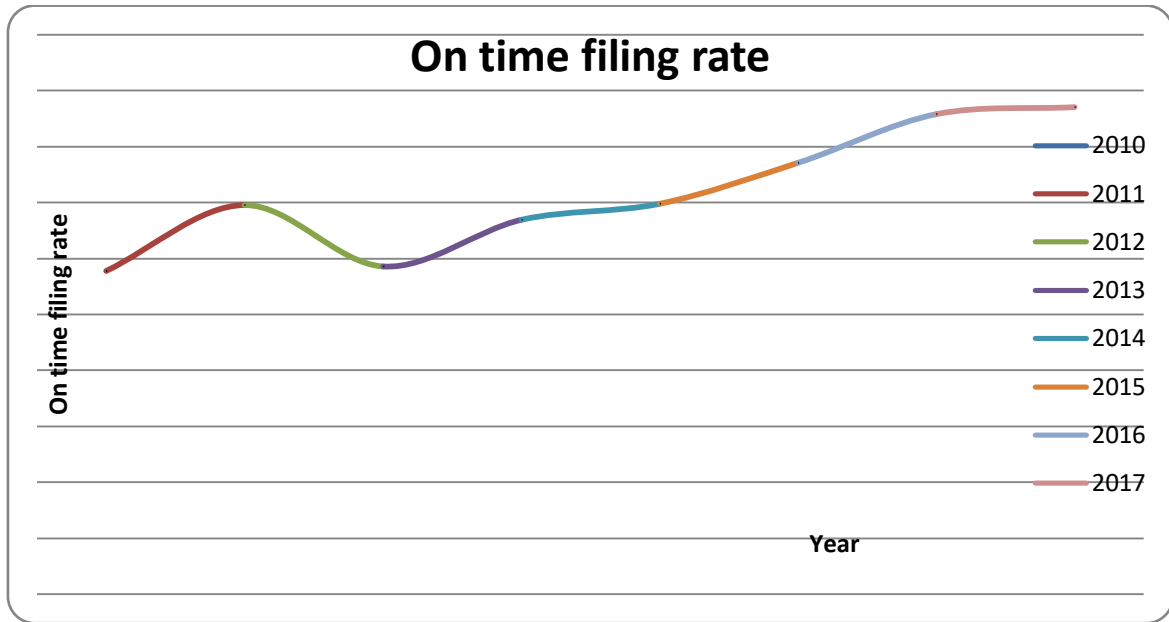


Figure 6: RRA statistics on on time filing rate

Figure 5 shows that the EBM has positive impact on time filing, the data from RRA Musanze station was collected and analysed then the results confirmed that from 2010 up to 2013 the rate of time filing was 57.8% in 2010, 69.6% in 2011, 58.6% in 2012 and 66.9% in 2013 before the EBM adoption. Then after

the adoption of EBM the on time filing rate was increasing, means in 2014 was 69.8%, 2015 was 77.1%, 2016 was 85.8% and in 2017 was 87.1%. this results confirmed that the the adoption of EBM have positive impact on time filing rate.

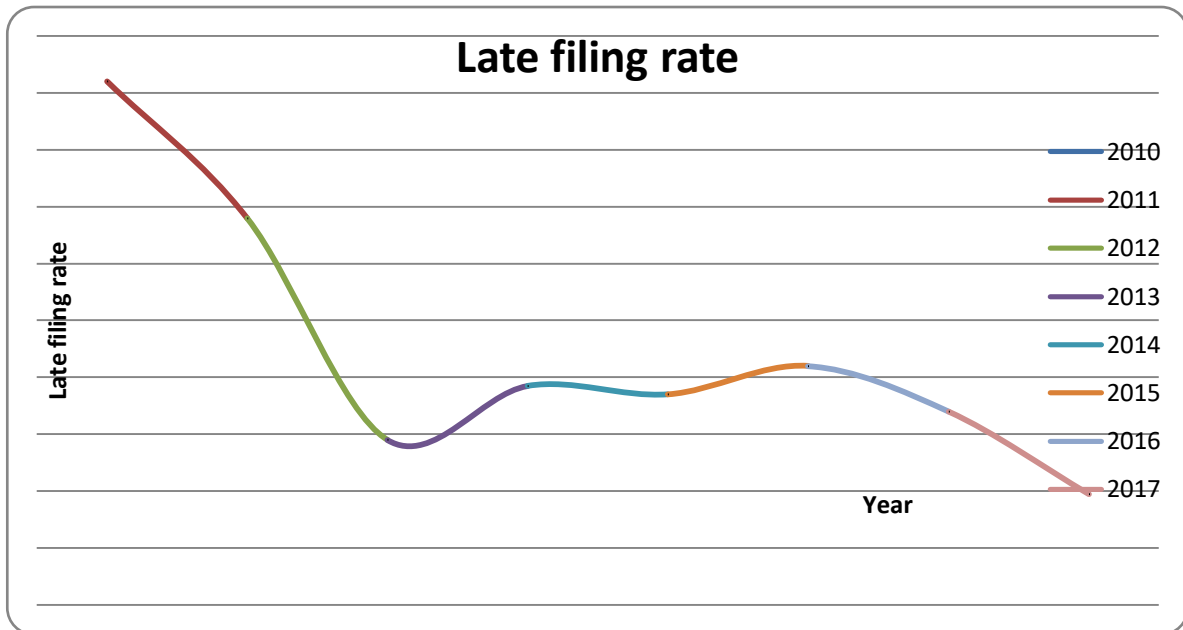


Figure 7: RRA statistics onlate filing rate

Figure 6 shows the late filing rate before and after the EBM adoption, the results confirmed that from 2010 up to 2013 the late filing rate was 18.4% in 2010, 13.6% in 2011, 5.8% in 2012 and 7.7% in 2013 before the EBM adoption. Then after the adoption of EBM the

late time filing rate was decreasing, means in 2014 was 7.4%, 2015 was 8.4%, 2016 was 6.8% and in 2017 was 3.9%. this results confirmed that the the adoption of EBM have positive impact on decreasing late filing rate.

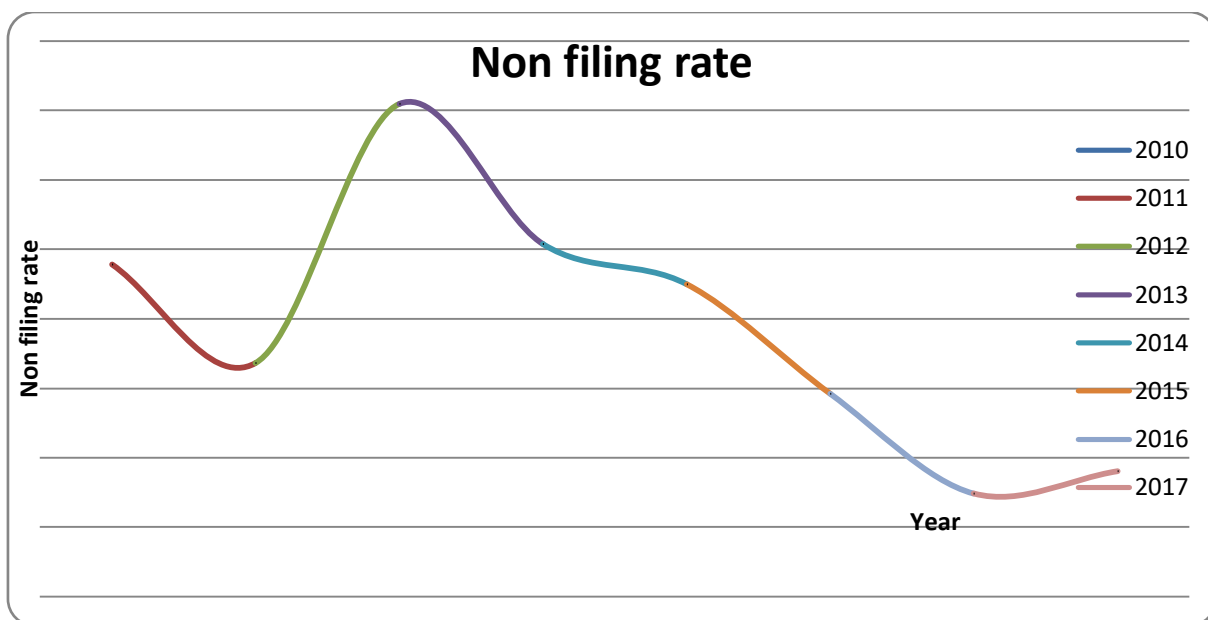


Figure 8: RRA statistics on non filing rate

Figure 7 shows the non filing rate before and after the EBM adoption, the results confirmed that from 2010 up to 2013 the non filing rate was 23.9% in 2010, 16.8% in 2011, 35.5% in 2012 and 25.4% in 2013 before the EBM adoption. Then after the adoption of EBM the

non filing rate was decreasing, means in 2014 was 22.5%, 2015 was 14.6%, 2016 was 7.4% and in 2017 was 9.0%. this results confirmed that the the adoption of EBM have positive impact to decrease non filing rate.

Table 25: Statistics on payment rates of VAT liabilities before and after the adoption of EBM at Musanze

N°	YEAR	On time payment rate	
1	2010	70.3%	BEFORE
2	2011	60.6%	
3	2012	75.1%	
4	2013	79.4%	
5	2014	82.7%	AFTER
6	2015	84.3%	
7	2016	84.5%	
8	2017	82.3%	

Source: RRA Musanze station, 2017

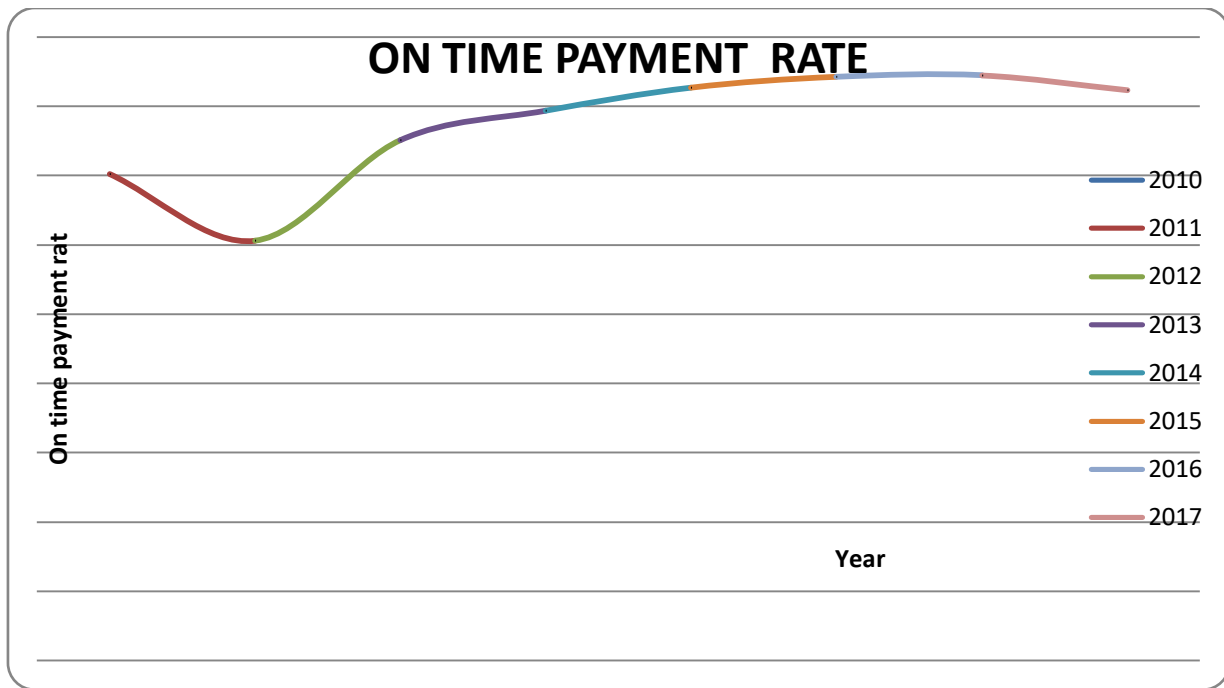


Figure 9: RRA statistics on timely payment rate

The figure 8 shows the time payment rate, before and after the adoption of EBM from 2010 up to 2017. The analysed data confirmed that from 2010 up to 2013 the time payment rate was 60.6% in 2010, 75.1% in 2011, 79.4% in 2012 and 82.7% in 2013 before the EBM adoption. Then after the adoption of EBM the time payment rate was increasing, means in 2014 was 84.3%, 2015 was 84.5%, 2016 was 82.3% in 2017. This results confirmed that the the adoption of EBM have positive impact to increase time payment rate.

d) Correlation Analysis

The correlation coefficient is a number between -1 and +1 that measures both the strength and direction

of the linear relationship between two variables. The magnitude of the number represents the strength of the correlation. A correlation coefficient of zero represents no linear relationship, while a correlation coefficient of -1 or +1 means that the relationship is perfectly linear (all of the dots fall exactly on a straight line). The sign (+/-) of the correlation coefficient indicates the direction of the correlation. A positive (+) correlation coefficient means that as values on one variable increase, values on the other variable tend to also increase; a negative (-) correlation coefficient means that as values on one variable increase, values on the other tend to decrease, that is, they tend to go in opposite directions.

Table 26: Correlation

		Mandatory usage of EBM	Frequency audit	Frequency of tax education	Frequency of tax advisory visits
Mandatory usage of EBM	Pearson Correlation	1	.936**	.913**	.843**
	Sig. (2-tailed)		.000	.000	.000
	N	159	159	159	159
Frequency audit	Pearson Correlation	.936**	1	.889**	.835**
	Sig. (2-tailed)	.000		.000	.000
	N	159	159	159	159
Frequency of tax education	Pearson Correlation	.913**	.889**	1	.934**
	Sig. (2-tailed)	.000	.000		.000
	N	159	159	159	159
Frequency of tax advisory visits	Pearson Correlation	.843**	.835**	.934**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	159	159	159	159

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

Table 28 is the Pearson correlation coefficient for factors of Electronic Billing Machine and VAT compliance indicators of small and medium size enterprises in Rwanda. From the correlation analysis, it can be deduced that there is a positive relationship between the mandatory usage of EBM for all VAT registration and frequency audit, where the correlation coefficient was 0.936 and a p-value of 0.000. The findings indicate that the frequency audit and mandatory usage of EBM correlate positively with correlation coefficients of 0.936 and p-value of 0.000. The study further established that there is a positive relationship between frequency of tax education and mandatory usage of EBM with a correlation coefficient of 0.913 and p-value of 0.000. Furthermore, the study found that there is a positive relationship between the frequency of tax education and mandatory usage of EBM. Lastly, the study found that there is a positive relationship between the frequency of tax advisory visits causes of mandatory usage with a correlation coefficient of 0.843 and a p-value of 0.000.

These findings clearly show that all the four independent variables (mandatory usage of EBM for all registered, frequency of audit and inspection conducted on taxpayers, frequency of tax education and frequency of tax advisory visits) had a significant influence on the dependent variable (VAT compliance). This is because the p-value in all the relationships was 0.000 which is less than the alpha value (level of significance) 0.01. From these findings we can infer that mandatory usage of EBM and frequency audit and inspection conducted on taxpayers had the most significant influence on mandatory usage followed by frequency tax education and frequency of tax advisory visits.

e) *Combined linear regression Model*

Regression analysis was done to determine the relationship between Electronic billing machine (EBM) and VAT compliance.

Table 27: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.544 ^a	.291	.288	.13577

a. Predictors: (Constant), mandatory usage of EBM, frequency audit and frequency advisory visits

Table 19 shows that the coefficient of determination R square is 0.294 and R is 0.544 at 0.05 significant level. The coefficient of determination indicates that 29.1% of the variation in the dependent

variable VAT compliance is explained by the independent variables (mandatory usage of EBM for all registered, frequency of tax audit, tax education and frequency advisory visits).

Table 28: ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	.573 ^a	3	.192	11.268	.000 ^b
1 Residual	1.383	52	.018		
Total	1.853	55			

a. Dependent Variable: Tax litigation

b. Predictors: (Constant), mandatory usage of EBM for all registered, tax education, frequency of tax audit, frequency advisory visits

Table 30 presents the results of Analysis of Variance (ANOVA) on usage of Electronic billing machine and VAT compliance. The ANOVA results for regression coefficient indicate that the significance of the F is 0.00 which is less than 0.05. This implies that there is a positive significant relationship between the adoption of EBM and VAT compliance and that the model is a good fit for the data. The ANOVA test in Table 30 indicates that the significance of the P value 0.000 is less than 0.05, implying that null hypothesis is rejected, and alternative hypothesis accepted. It is

concluded that there is a significant effect of adoption of EBM and VAT compliance for small and medium enterprises.

VI. CONCLUSION AND RECOMMENDATIONS

a) Conclusion

According to the results of this study based on the objective of assessing the impact of the adoption of EBM on timely filing of VAT declaration compared to the period before EBM is introduced in Rwanda, 93% of all respondents confirmed that the adoption of

mandatory usage has a positive influence of timely filing of VAT return. This was confirmed as well by the report of RRA on VAT filing rate from the year 2010 to 2017, whereby the figures demonstrate that the adoption of mandatory usage of EBM by all VAT registered of RRA Tax station has reduced the late filing rate by 14 % and by and non filing rate by 20%.

Regarding the results obtained by analyzing the data collected basing on the objective of assessing the impact of the adoption of EBM on timely payment of VAT liabilities , 92.4% of all respondents confirmed that EBM has a positive influence on timely payment of VAT liabilities. This finding was also confirmed by the report of RRA on payment rate of VAT from the year 2010 to 2017 whereby the report shows that after the introduction of EBM the payment rate of VAT was increase by 20%.

In regard with The results obtained by analyzing the data collected basing on the objective of assessing the impact of the adoption of EBM on accurate reporting in VAT declaration, 90% of all respondents confirmed that the adoption of mandatory usage of EBM has a positive impact on reporting of VAT sales comparing to VAT sales that were declared before the adoption of EBM , in addition 96.8% of all respondents confirmed that the adoption of mandatory usage of EBMs has a positive on VAT payable and collected by RRA comparing to the VAT that was collected before the adoption of mandatory usage of EBM. These findings are confirmed by the RRA report on VAT collections before and after the adoption of EBM whereby report shows that after introduction of EBM VAT collections increased by 732 % , that means increased by 7 times . In addition the RRA report shows as well that, after the introduction of EBB, sales reported by taxpayers were also increased by 737 %.

Regarding the results obtained by analyzing the data collected basing on the objective of assessing the impact of the adoption of EBM on voluntary VAT registration,79.9% of all respondents confirmed that the mandatory usage `of EBM has a positive impact on voluntary VAT registration . This finding was also confirmed by the report of RRA on figures about the number of taxpayers voluntarily registered for VAT from the year 2010 to 2017 whereby the report of RRA indicates that after introduction of EBM the number of voluntary VAT registration increased by 346 %.

The correlation coefficient on analysis of the relationship between mandatory usage of EBM and indicators of VAT compliance is 0.586. this value indicates that correlation is significant at 0.05 level (2tailed) and implies that there is a positive relationship between mandatory usage of electronic billing machine and VAT compliance indicators of (r= .586). We can therefore conclude Electronic Billing Machine contribute positively to VAT compliance in Rwanda.

According to the results of this study obtained from the analysis of the data collected basing on the objective of assessing the significance of other compliance activities that have been always used by RRA to improve VAT compliance, 69.8 % all respondents confirmed that the frequency of audit has a positive influence accurate reporting in VAT.

Regarding the activity of Tax Education, 80.5 % of all respondent confirmed a positive influence of Tax education on timely filing of VAT declaration while 80 % of all respondent confirmed that Tax education has a positive influence on timely payment of VAT liabilities and accurate reporting in VAT declaration and 88% of all respondents confirmed a positive impact of Tax education on voluntary registration.

Regarding the activity of Tax advisory visits, 86.6% of all respondent confirmed a positive influence of tax advisory on voluntary VAT registration followed by 86.2% of all respondents who confirmed as well that Tax advisory visits have a positive influence on accurate reporting in VAT declaration.

In conclusion The findings of this study clearly show that all the four independent variables (mandatory usage of EBM for all registered, frequency of audit and inspection conducted on taxpayers, frequency of tax education and frequency of tax advisory visits) had a significant influence on the dependent variable (VAT compliance). Therefore to improve VAT compliance through EBMs. RRA is recommended to come up with plan integrating EBMs within broader tax compliance frameworks that create the environment which will best ensure taxpayers' voluntarily compliance. This suggests that the most cost-effective way to improve compliance will likely involve a small number of high-profile enforcement activities (targeting high-risk evaders), close monitoring and reviewing of activities (for medium-risk evaders) and improved tax information and facilitation activities for the majority of taxpayers.

b) Recommendations

Basing on the results of this study, following actions are recommended:

Regular identification of EBM non usage: RRA should be able to reliably identify when a taxpayer is not using EBM using data from back office guiding field visits interventions. Tax advisory visits for taxpayers who regularly failed to use EBM, as the results of this research have confirmed the positive impact of tax advisory on VAT compliance ;

Deterrent measures against to regular Defaulters of EBM usage: RRA needs to be willing and able to enforce receipt issuing on taxpayers who usually fail to issue receipt because if there is no sanctions for defaulters it can lead to negative competition against compliant taxpayers operating in the same sector and decrease their compliance.

Extensive communication strategy: Through tax education, tax awareness campaigns, tax dialogues and media, RRA should communicate their focus and ability to enforce EBM receipting for any specific sector. This will further facilitate voluntary compliance;

Higher Risk Tax payers (High risk, big consequences): For this category of taxpayers, real time deterrence is recommended. This may include surprise checks, comprehensive audit and continuous monitoring of compliance in respect of timely filing of VAT return, timely payment of VAT liabilities and accurate reporting regular checked basing third party information, data matching;

Key taxpayers (Low risk, big consequences): For this category of taxpayers, regular monitoring of their tax return is recommended, regular tax advisory visits to address issue of non-compliance with EBM instead of conducting audit, tax dialogues and regular reminders advising them to file and pay before due dates in order to avoid penalties;

Medium risk taxpayers (High risk, low consequences): For this category tax education and close monitoring of their tax returns and discuss with taxpayer on any discrepancies identified. Tax advisory visits and desk audits are appropriate to boost compliance of these taxpayers instead of using deterrent measures;

Lower risk taxpayers (Low risk, low consequences): Tax education, tax advisory visits and periodic review of their tax returns and EBM back office followed by reminders if there any tax issue to address without conducting audit.

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The Role of School Principals in Improving Students' Academic Performance in Secondary Schools of Sidama Zone, SNNPR

By Habtamu Gezahegn

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Abstract- This paper is aimed at examining the roles played by school principals in improving students' academic achievement in secondary schools of Sidama zone in Southern Nations Nationalities and Peoples' Region of Ethiopia. It is a mixed type of research, which employed both qualitative and quantitative data. The findings of the study indicated that school principals have not adequately played roles expected of them to improve students' performance. Most of them do not have adequate training in school management and are subject teachers who were currently promoted to principal-ship position. They attempted to maintain their status quo rather than introducing changes. Those challenges hindering school principals from promoting students' academic performance do exist at the moderate level and some of the major challenges were large class size, failure to introduce new programs to school curriculum, lack of commitment on the part of school community and lack of school pedagogical centers.

Keywords: *academic performance, secondary schools, sidama zone, SNNPR.*

GJMBR-G Classification: *JEL Code: A29*



Strictly as per the compliance and regulations of:



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I. INTRODUCTION

The success or failure of a school is usually attributed to the level of principals' leadership effectiveness. A school principal is the pivot around which many aspects of the school revolve, being the person in charge of every detail of running the school, be it academic or administrative. Schools can make a difference to students' achievement and the principal's leadership is one those factors determining that success. It is therefore important that the performance of a school is appraised against the performance of the person who leads it.

In school compound, principals are the most important individuals while the teaching-learning process is the crucial activity that principals should run properly in order to promote students performance. To ensure this, principals need to update themselves with different contemporary leadership practices using different long and short term trainings because the effectiveness of a school is directly or indirectly related to the leadership effectiveness of the principal running it. A vast body of research on effective schools provides consistent evidence that effective leadership is the key factor for school improvement and student achievement

(Duke & Stiggins, 1985). School leaders do have a quantifiable, yet predominantly indirect influence on student outcomes (Mulford, 2008). Wanyama (2013), also adds that the success of a school to a great extent depends upon its principal.

If school principals exert more of their time on improving the quality of teaching and learning in their school, then they are likely to have a far greater influence on student outcomes. Many scholars (like Gamage, Adams and McCormack 2009) have acknowledged that the role of school principal is the most significant in enhancing school performance and students achievements. Principals' influence on teachers will indirectly be observed on students. Pont, Nusche and Hunter (2008) explain that principals can affect the working conditions and motivations of their teachers, who do directly influence classroom practice and student learning.

Thus, the purpose of this study is to assess the role of school principals as leaders in improving students' academic performance in secondary schools of Sidama zone, in Southern Nations' Nationalities and Peoples' Region (SNNPR) of Ethiopia. Accordingly, principals' efforts in improving students' performance, teachers' and school leaders' perception of principals attempts to enhance students' performance, and challenges encountered so far are examined in this study. Accordingly, the study attempted to answer the following basic questions:

- 1) To what extent have the school principals played their roles in improving students' academic performance in secondary schools of Sidama Zone?
- 2) What is the perception of teachers and school leaders towards principals' roles in improving students' academic performance in the target secondary schools?
- 3) What are the major challenges hindering principals' attempts to promote students' academic performance in those schools?

II. LITERATURE REVIEW

- a) *School Principals' Roles in Improving Students' Academic Performance*

The fact that current research reports principal leadership as one of the most significant factors

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affecting student achievement clearly indicates principals must have a thorough understanding of their roles as instructional leaders. In addition, principals must also have the ability to fulfil each of their roles as instructional leaders by effectively utilizing researched based practices. Successful schools in challenging environments usually have leaders who engage closely with, and are consequently highly trusted by their schools' key stakeholders and surrounding community (Hargreaves, Halasz & Pont, 2008). These leaders spent more time in schools with children and placed more focus on improving student welfare and attainment through involvement with partners in their wider community including sports clubs, businesses, and religious groups (Price water house Coopers, 2007). One of the findings from the study conducted by Sebastian and Allensworth (2012) indicates that student achievement was related to principal leadership, but only through the learning climate created.

Similarly, through a statistical process known as meta-analysis, researchers such as Waters, Marzano, and McNulty (2004) analyzed the results of 70 principal leadership studies and found certain direct leadership practices significantly correlated with improved student achievement. Among these were systematically visiting classrooms, frequently interacting with students, publicly celebrating accomplishments of students, and maintaining visibility around the school. Generally, many scholars have acknowledged that the role of school principal is the most significant in enhancing school performance and students achievements.

Hallinger's (2010) review of empirical research on school leadership also inferred that leaders can have indirect or mediated positive effects on student achievement by building a collaborative organizational learning culture, and helping to develop the leadership capacities of staff and community. Relevant literature (e.g., Day et al., 2016; Mulford, 2008) have concurred that school leaders do have a quantifiable, yet predominantly indirect influence on student outcomes. The impact that school leaders can have on student learning is often moderated by other factors including teacher quality, classroom procedures and school environment.

b) *How do Principals Affect Students' Learning?*

Discussions about the scope of principal's job too often focus on a to do list: helping teachers improve their teaching using data to review and refine the instructional program and enduring that the school is kept clean and safe. The more abstract but very tangible elements of leadership, however, are often what spell the difference between adequate and excellent principals. The research can address this aspect of the link between principal leadership and students learning.

Louis et al (2010) offered a definition of leadership that is distilled from the essence of their findings leadership is all about organization improvement; more specially, it is about establishing agreed- upon and worthwhile directions for the organization in question, and doing whatever it takes to prod and support people to move in those directions.

In the executive summary of that report, the researchers said that leadership effects on students learning occur largely because leadership strengthen professional community, teachers engagement in professions community, in turn, fosters the use of instructional practices that are associated with student achievement (Wahlstrom, Louis, Leithwood, & Anderson, 2010).

Other researchers conducted meta-analysis that focused on the relationship between leadership and students achievement. They also found that principal leadership is corrected with student achievement and that there were especially strong links between specific principal behaviours and student learning. One such behavior was the extent to which the principal is aware of the details and under currents in the running of the school and uses this information to address current and potential problems (Waters, Morzano, and McNulty, 2004). In the view of those researchers, effective leadership means more than knowing what to do- it's knowing when, how, and why to do it (Waters et al, 2004).

In recent report, the Wallace foundation (2011) identified five key functions of principal leadership: Shaping vision of academic success for all students, creating a climate hospitable to education, a cooperative spirit and other foundations of fruitful interaction prevail; cultivating leadership in others so that teachers and other adults assume their part in realizing the school vision; improving instruction to enable teachers to teach at their best and students to learn at their utmost and managing people, data and processes to foster school improvement.

The report identified an important qualification about those key leader functions: Each of these five tasks needs to interact with the other four for any part to succeed. It is hard to carry out a vision of student success for example, if the school climate is characterized by student's disengagement, or teachers do not know what instructional methods work best for their student, or test data are clumsily analyzed. When all five tasks are well carried out, however, leadership is at work (Wallace Foundation, 2011).

c) *Teachers' Perceptions of Principals*

As mentioned earlier in this paper, principals can indirectly affect students' performance through their influence on teachers. In relation to this, Wong (1999) has the following to say:

"The only factor that increased student achievement was the significance of the teacher. Thus, administrators create good schools and good teachers create good classrooms." (p.1) Therefore, any form of leadership that helps to increase teachers' knowledge of their content and improve their classroom management skills should be a consideration.

In essence, the primary role of the principal is to increase individual teacher efficiency and the staffs' collective efficacy. That means a principal needs to recognize individual teachers' beliefs about their ability to influence student learning. The collective efficacy represents teachers' perceptions regarding the staff ability as a whole to ensure student learning. In relation to this idea, Mcquigan (2009) states, "if the daily actions of principals make a difference in student academic achievement, schools can be improved by improving or replacing principals" (p.2). So if a school principal devotes more of his effort and resources towards teachers' empowerment for the betterment of students' achievement, teachers will develop positive attitude towards their principal.

In the past, few researches have been conducted on teachers' views on principal practices that positively influence their classroom practices. A study conducted by Blase and Blase (2001) investigated teachers' descriptions of their principals' attitudes, strategies, behaviours and goals that had an influence on their classroom instruction. Barnett, Marsh, and Craven's (2003) study on teacher satisfaction also indicates that teachers were positively influenced by their principals' individualized considerations and negatively influenced by their principals' laissez-faire leadership behaviours. In addition to the above authors, Berube, Gaston and Stephans (2004) state that teacher perceptions of principal as instructional leader can have a major impact on the school, which in turn can influence students' performance.

Bulach, Boothe and Pickett's (2006) research on teachers' perceptions of principals suggests that principals' human relation skills, levels of trust, the way decisions are made, and the failure to empower subordinates and deal with conflict are often why principals are either successful or not successful as educational leaders.

d) *Challenges that Principals Encounter in Improving Students' Performance*

The principal's efforts to improve students' academic performance are not easy tasks. They may be hindered by several factors which the principal should overcome. Njuguna (2004) found out in her research that some of the factors that have negative impact on students' performance were: inadequacy of some teaching/learning resources, lack of efficient school based curriculum monitoring, inability by the teachers to

complete the syllabuses in time, students' characteristics such as indiscipline, poor entry behaviour, frequent absenteeism, and inadequate parents' participation in school affairs due to poverty.

Major factors that affect a secondary school principals' practices could be associated with: poor management, budget deficit, pupils with low internal efficiency, poor motivation and self esteem, inadequate school resources including buildings, academic staff, and low levels of parent involvement. As indicated above, principal's tasks are complex and need a lot of efforts to overcome them. Some of these challenges can be external and attributed to local government politicians, the community, government policies and the likes. Likewise, school principals can face many challenges internally like problems related to teachers, students, and school administration. Teachers' lack of commitment and uncooperative attitudes, coupled with lateness and alcoholism, which affects the output negatively are challenges for head teachers today (Kusi, 2008).

The 21st century expectations of schools are now requiring different types of leadership skills from principals. This stems from the fact that in addition to instructional and programming pressures, today's principals are also facing challenges that include budgetary reductions, school safety, contract administration, supervision, data management and marketing. Thus, in addition to effective instructional leadership skills, a principal's effectiveness during this new educational era will also require complex knowledge and skills related to organizational culture and management.

II. RESEARCH DESIGN AND METHODOLOGY

In this study, attempts were made to describe the role of school principals in improving students' academic performance in selected secondary schools of Sidama Zone. Hence, descriptive survey research design was employed, as it enables a researcher to describe the current status of an area of study (Best & Khan, 2003). Descriptive survey research method allows the researcher to gather data from relatively large number of respondents within short period of time with minimum cost. "Descriptive research attempts to describe systematically a situation, problem, phenomenon or attitudes towards an issue" (Kumar, 2005:8). It reduces the absence observed and easily describes every phenomenon under studies. So the researcher employed this research design weighing its convenience.

As far as the research method is concerned, both qualitative and quantitative methods were employed to offset the weakness of one by another. The researcher initially used quantitative method through survey questionnaire, while he also employed interview

and FGD to substantiate the quantitative data. There is a rationale to use multiple approaches in this study. First, using such method is advantageous to examine the same phenomenon from multiple perspectives (Cohen et al., 2007). Second, this approach is important to build upon the strength that exists between quantitative and qualitative methods in order to understand a given phenomenon than is possible using either quantitative or qualitative methods alone (Creswell, 2003).

a) *Population, Sample and Sampling Techniques*

The target populations of the study were secondary school principals, teachers, PTA members, and wereda education office experts. The researcher assumed they are the right sources of information for this study. In Sidama Zone, there are 19 Woredas/districts. For this study, 5 Weredas, were selected using simple random sampling techniques to get representative samples and to allow every subject

get equal chance of being selected. In the selected sample weredas there are 20 secondary schools out of which 10 schools (50%) were selected by using simple random sampling technique. This is because the researcher believed that the schools are almost in the same status to be selected uniformly. The secondary schools included are Dila Aferara, Telamo-Tumano, Haroshifa, Kenera, Tuticha, Bursa, Hawassa Langano, Jara Dado, Malga-Madicho and Wotararesa, secondary schools.

In the selected secondary schools, there are 320 teachers and 100 school leaders (principals, vice principals, unit leaders and department heads). Out of these, 160 (50%) of the teachers, and 40 (40%) of the school leaders were selected to be the participants of the study through simple random sampling technique (see table 1). This is to get representative samples and to let every subject have equal chance to be selected.

Table 1: Summary of Population, Samples and Sampling Techniques

No.	Target	Population	Sample	%	Sampling Technique
1	Teachers	320	160	50	Random sampling
2	School Leaders	80	40	50	Random sampling
3	WEO experts	10	5	50	Purposive
4	PTA	50	10	20	Purposive

Moreover, 10 members of PTA (one from each school) and 5 wereda/district education office experts were included in the study purposively based on their rich experience and the direct concern they have with the issue under investigation.

b) *Instruments of Data Collection*

To get relevant information from respondents, different data gathering tools were employed. Accordingly, questionnaire was conducted with teachers and school leaders because their number is relatively larger while interview items were conducted with wereda education office (WEO) experts. Data from Parent Teacher Association (PTA) members were solicited through Focus Group Discussion (FGD) method. Out of all the questionnaires dispatched to respondents, 150 (93.75%) from teachers and 40 (100%) from school leaders were properly retrieved and used for data analysis. To rate respondents' attitude, Likert scales ranging from strongly disagree (1) to strongly agree (5) and rating scales ranging from very Low (1) to very high (5) were employed. The content validity of the instruments was checked by involving three experts currently working at Hawassa University while the reliability of the instrument (questionnaire) was checked by randomly selecting 30 teachers in the neighbouring secondary school (named Motto secondary school), which is excluded from the sample schools. Accordingly, the overall coefficient of reliability test for all

items was found to be 0.87, which indicates that questions in each construct measure similar concept. As suggested by Cronbach (cited in Tech-Hong & Waheed, 2011), the reliability coefficients between 0.82-0.94 are generally found to be internally consistent.

To make good relationship and avoid confusion during the interview sessions, the investigator already made pre-contact with the interviewees. Establishing rapport is, according to Best and Khan (2009), the key to effective interviewing. Data from parent teacher association (PTA) members were solicited using focus group discussions. The focus group consisted of 10 individuals, as per the suggestion of Marczyk, DeMatto and Festinger (2005). These authors recommend that the number of FGD participants should typically be composed of several participants, usually 6 to 10 individuals. The discussion lasted for 35 minutes and the researcher acted as a moderator, listener, observer, and eventually analyst using an inductive process (Krueger & Casey, 2000). The researcher selected FGD as an instrument because it presents a more natural environment than that of an individual interview and participants are influencing and influenced by others just as they are in life (Krueger & Casey, 2000).

c) *Data Analysis*

In this study both qualitative and quantitative data analysis techniques were employed. The quantitative data obtained through questionnaires were

edited, categorized tallied, and tabulated. The data, then, were analyzed using appropriate descriptive and inferential statistics. Thus, mean, standard deviation and independent sample t-test were used. The results were obtained and the relationship of each variable is thoroughly interpreted and discussed on the basis of key question. Quantitative analysis was done through the software called Statistical Package for Social Sciences (SPSS) version 20. The qualitative data gathered through interview and focus group discussion were described as supplementary evidence in addition to the discussions of quantitative data. The data were analyzed using narrative description and quoting as it is. Finally, conclusions were drawn from the major findings.

d) *Ethical Considerations*

Responding to interviews, attending FGD and filling questionnaires require significant time and energy. Its participation could also disrupt respondents' regular activity. For this reason, the researcher got consent of the respondents by explaining the objective and

significance of the study and allowing them to exercise their right to participate voluntarily. To avoid any psychological harm, questions were framed in a manner that they could not disrupt the respondents' feelings. The respondents were informed that the information they provide would be kept confidential.

III. RESULTS

a) *Roles Played by Principals in order to Improve Students' Academic Performance*

Table 2 describes the degree of roles played by school principals in improving students' academic performance. To this end, 8 items were forwarded to respondents to obtain their opinion. Accordingly, the following rating scales were used to compute the responses obtained:

- The mean scores from the data analysis were interpreted as follows: ≤ 2.59 low, $2.60 - 3.39$ medium, ≥ 3.40 high.

Table 2: The Extent to which School Principals Play Different Roles in Improving Students' Academic Performance

SN	Items	Respondents Type				t-value	p-value
		Teachers (N=150)		School Leaders(N=40)			
		Mean	SD	Mean	SD		
1	Efforts to create confidence among students	2.33	1.23	2.75	1.20	-1.39	.165
2	Extent of taking best practices as models for students learning	2.53	1.14	2.40	1.09	.468	.041
3	Extent of building trust and respect among students	2.46	1.17	2.75	1.11	-1.01	.012
4	Attempt to treat others as individual rather than as a group	2.22	1.39	1.86	1.14	-2.06	.040
5	Ability to assemble resource for certain task achievement	2.36	.858	2.35	.933	.091	.927
6	Extent of supervising teaching and learning	2.73	1.25	2.90	1.20	-.557	.579
7	Efforts to communicate vision, mission and goals to the school community for the betterment of students performance	2.24	.874	2.85	.875	-.512	.009
8	Analysis of exam results to identify students academic performance problems	2.04	.738	2.20	.767	-.888	.376
	Overall	2.36	.211	2.51	.37	-.961	.353

Note: Throughout all the tables, SD- is standard deviation; t-value is independent sample t-test. P is significant at $p < 0.05$.

As it can be seen in Table 2 item 1, the principals' roles in creating confidence among students was rated to be low by teachers with $\bar{x}=2.33$, $SD=1.23$, indicating extent of creating confidence among students by school principals to be low, while the school leaders ($\bar{x}=2.75$, $SD=1.20$) revealed that the extent of creating confidence among students by school principals was at the moderate level. On the other hand, the calculated t-test value ($t= -1.39$, $p>0.05$) showed that there is statistically no significant difference between the teachers and school leaders on this issue. This implies that extent of creating confidence among students in

directing them towards goals to be achieved was below satisfactory.

Table 2 item 2 presents the extent of principals modelling best practices of the school. In this concern, the mean scores of teachers ($\bar{x}=2.53$, $SD=1.14$) was moderate while that of the school leaders ($\bar{x}=2.40$, $SD=1.09$) indicated that principals level modelling best practice of the school was rated to be low. On the other hand, the calculated t-test value ($t=.468$, $p<0.05$) showed that there is statistically significant difference between teachers and school leaders on the extent to which principals model best practices of their schools.

In spite of the existence of significant difference between the two groups, it could be understood that, principals modelling best practice of the school is almost rated to be inadequate.

In the interview conducted with wereda education office experts, one of the interviewees (Exp 1) revealed the following:

Principals have exerted their efforts to take best practices as models for the betterment of students' learning but the practices are inadequate and lack consistency. So this is among the issues need to be emphasized by school principals.

Table 2 item 3 indicates the extent to which principals build trust and respect among students in order to improve students' academic performance. The mean score of teachers ($\bar{x}=2.46$, MD=1.17) showed minimum efforts made in this regard, while the school leaders ($\bar{x}=2.75$, SD=1.11) rated this item to be moderate. This indicates that the level of efforts exerted by principals to build trust and respect among their students is insufficient. It was seen that there is statistically significance difference between the two groups of respondents, with the t-test value ($t=-1.01$, $p=.012<0.05$). This showed that principal's made minimum efforts with regard to this item. During the discussions made with the PTA members, the following points were raised concerning this issue:

Principals and those working in managerial positions in our school are not well concerned with hearing students' grievances. Every time students come to offices for information or complaints, nobody want to give them attention including the secretary.

Here, one can understand that, even though school leaders wanted to suppress the fact by rating the item moderate ($\bar{x}= 2.75$), teachers and the PTA members opined that the efforts made by principals to build trust and respect among students was at its minimum level.

As it can be seen in Table 2, statistically significant differences were observed between respondents as shown by item 4 ($P=.040<0.05$) and item 7 ($P=.009<0.05$). In the remaining items (items 5, 6 and 8), no significant opinion differences were observed between the respondents.

Overall, as per the cut points previously set, school principals' roles in improving students' academic performance in secondary schools of Sidama Zone was rated to be below average by both teachers ($\bar{x}=2.36$) and school leaders ($\bar{x}= 2.51$). There is also statistically no significant difference between the two groups ($P=.353> 0.05$). The interview result from experts (Exp 2 and 3) is summarized as follows in relation to this concept:

Principals' roles in improving students' academic performance in our secondary schools is said to be minimal. For instance, the activities undertaken in schools starting from conducting the teaching and learning process till the provision of tests and exams were not given adequate attention. Especially, the exam system in our schools needs to be revised. Students are seated in classes in crowded form and invigilators are not serious in their invigilation, which gives way for cheating. Let alone on quizzes and tests, our principals are not serious in warning the invigilators during national exams. So how can we talk of student achievement in such an environment?

As clearly put by the interviewees, academic honesty is one of the issues need to be considered by principals if they want to promote students' performance. Wilkinson (2009) put that cheating is considered as one of the forms of academic misconduct that has become one of the biggest concerns of educational institutions. This may discourage hard-working students and affect school assessment system. In relation to this, Boulville (2008) writes that cheating undermines not only learning but also the validity and reliability of assessment.

From educators and administrators in understanding because cheating undermines not only learning (Boulville, 2008) but also the validity and reliability of assessment.

b) Perception Level of Teachers and School Leaders

Table 3 presents teachers' and school leaders' perception of principals' roles in improving students' performance. Accordingly, 10 items were presented to the respondents to obtain their opinions on different issues.

Table 3: Teachers' and School Leaders' Perception of Principals' Attempt in Improving Students' Academic Performance

SN	The school principals:	Respondents Type				t-value	p-value
		Teachers (N=150)		School Leaders(N=40)			
		Mean	SD	Mean	SD		
1	Skillfully develop different programs that improve the instruction	1.72	.092	2.88	1.42	-7.55	.000
2	Take more of their time to follow whether the educational activities are carried out in accordance with the plan or no	2.41	1.25	1.85	0.89	-3.92	.000
3	Continuously give constructive feedbacks that improves teachers performance in teaching	2.05	1.24	1.95	1.19	-.354	.724
4	Consider ideas and suggestion of teachers to improve academic achievement of students' in the school	1.96	.987	2.40	1.09	1.73	.085
5	Work cooperatively with staff for solving problems and making participatory decisions	2.60	1.44	2.63	1.48	-.126	.900
6	Provide adequate school facilities that enable to facilitate the teaching learning process	2.57	1.63	2.58	1.45	-.052	.959
7	Encourage staff attendance at workshop, seminar and conference to update them on current issues for the betterment students	2.06	1.20	2.07	1.17	-.025	.980
8	Actively work to ensure highest academic achievement of students	2.46	1.40	2.23	1.18	.908	.366
9	Encourage internal supervision to enhance the teaching learning process	2.60	1.37	2.32	1.21	1.06	.291
10	Delegate responsibility to others to work hard towards highest achievement of students	1.76	.817	2.11	1.16	-1.55	.123
	Overall	2.21	.348	2.30	.325	-.551	.588

Key:

M- is mean, SD- is standard deviation, t- is independent sample t-test and P is significant at $p < 0.05$.

The mean scores from the data analysis were interpreted as follows: ≤ 2.59 low, 2.60–3.39 medium, ≥ 3.40 high.

As shown in table 3 item 1, the respondents were requested whether school principals skillfully develop different programs that improve the instruction or not. In this regard, the calculated mean scores of teachers ($\bar{x}=1.72$, $SD=.092$) indicated disagreement with the issue, while school leaders ($\bar{x}=2.88$, $SD=1.42$) seem to agree with the issue by rating the item moderate. On the other hand, the calculated t-test value ($t= -7.55$, $p=.000 < 0.05$) shows that there is statistically significant difference between the two respondents on the issue. The FGD participants raised the following points concerning this issue:

In our schools, principals seem to keep their status quo rather than introducing different programs and practices to their schools for improvement of the instructional program. Supports given to teachers who are in need of conducting action research to improve instruction were also minimal.

Therefore, it could be concluded that principal have not adequately developed various programs that

improve the instructional program. As to Nasseh and Strauss (2000), schools must develop cultures, structures, and programs that support diverse students, staff, and faculty and need to develop activities and curricula that provide opportunities to learn about cultural diversity, race, ethnicity, and gender.

Concerning the rest of the items, except items 5 and 9 where the respondents' ratings were average, the mean computational results of the two groups were found to be minimal. Overall, the average mean of teachers ($\bar{x}= 2.21$) and that of school leaders ($\bar{x}= 2.30$) imply that the respondents unanimously rated principals' attempt in improving students' academic performance to be below average. The finding indicates that principal in the sample schools have not worked well to promote students' performance. Leithwood, Harris and Strauss (2010) explain that the principal is second only to teacher influence to improve student achievement. The P-value ($P= .588 > 0.05$) shows that there is no statistically significant difference between teachers and school leaders on this issue.

c) Challenges Affecting Principals' Efforts to Improve Students' Academic Performance

Below are 11 items forwarded to respondents to judge their perception of those factors negatively affecting school principals' efforts in improving students' academic performance.

Table 4: Major Challenges Hindering Principals' Attempts to Promote Students' Academic Performance

SN	Items	Respondents Type						
		Teachers (n=150)		School leaders (n=40)		Average mean	t-value	P-value
		Mean	SD	Mean	SD			
1	Lack of adequate class room in the school	4.00	.587	3.20	1.07	3.60		
2	failure in facilitating favorable conditions to make parents to participate in different school activities	3.76	.727	3.67	1.10	3.71		
3	Lack of adequate pupil text book ratio	3.37	1.37	2.89	1.48	3.13		
4	Lack adequate computers in the school	3.90	1.15	3.60	1.24	3.75		
5	Lack pedagogical center	4.07	.828	3.62	1.35	3.84		
6	Shortage of budget	3.49	1.46	3.67	1.33	3.58		
7	Lack of school community commitment	3.58	1.28	3.96	1.11	3.77		
8	Lack of adequate training on school leadership and management	3.70	1.33	3.88	1.18	3.79		
9	Lack of experience to manage and mobilize the school community towards shared goal	2.92	1.58	3.44	1.24	3.18		
10	Lack of regular supervisory support from the concerned education officials	3.70	1.18	3.68	1.19	3.69		
11	Lack of educational resource (financial and material)	3.60	1.29	3.80	1.26	3.70		
	Overall	3.64	.32	3.58	.31	3.57	.462	.649

Key: n= number of respondents, SD- is standard deviation, t-is independent sample t-test and P is significant at $p < 0.05$.

The mean scores from the data analysis were interpreted as follows: ≤ 2.59 low, $2.60 - 3.39$ medium, ≥ 3.40 high.

As depicted by items 1, 2 and 4 of table 4, both teachers and school leaders rated lack of adequate classroom, failure to facilitate favourable conditions for parents' participation and lack adequate computers in the schools to be the major challenges of school principals, with the average means of 3.60, 3.71 and 3.75 respectively. Especially, lack of adequate classrooms forced the target secondary schools to include many students in a single classroom. However, this is against the policy of MoE, which suggests not to put more than 40 students in a class at secondary level. In relation to this issue, one of the wereda education office experts (Exp4) revealed the following fact:

The problem of large class size is among the major obstacles not only to school principals but also to teachers in our schools. Sometimes teachers encounter large numbers as high as 65 students in a class, which makes situations very difficult for teachers, especially when they want to treat students individually as per their behaviours. So I personally suggest that the schools should mobilize the local community for the construction of additional classes if the regional government is not in a position to envisage this in the near future.

Many writers have raised the issue of class size at different times. For instance, Imoke (2006) puts that optimum class size implies rational coordination of educational infrastructures, subject to available number of students in order to attain high level of productivity. Managing class size allows students to learn effectively without disturbing one another (Garret, 2008). Contrary to the issues raised by the above authors, if the class size is too large for students to attend, it can have a serious drawback on students' performance. For example, Rubin (2012) indicated in his finding that, as the class size increases, student achievement declines. In their study of "Impact of Class Size on Students' Academic Performance in Biology" .Ruffina, Esther and Anastecia (2018) explained the following drawbacks of large class size:

Large class size may generate a lot of controversy due to the difficulty of teachers to work with large class size. These controversies may serve as thorns that crumble the performance of students in biology at the senior secondary school level. Some of these problems may be; teachers may find it difficult to use varied teaching methodologies in teaching, students may find it difficult to concentrate in the class, teachers may find it difficult to control the students in class and there may be insufficient teaching and learning resources (P.24).

Concerning items 5, 7, 8,10 and 11 of table 4 lack pedagogical centers, lack of commitment on the side of school community, lack of adequate training on

school leadership and management, lack of regular supervisory support from the concerned education officials and lack of adequate resources were also among the top rated challenges to principals with the average means of 3.84, 3.77, 3.79, 3.69 and 3.70 respectively. Here, in table 4, lack of resources was among the major challenges rated by the two groups of respondents with the average mean (\bar{x} = 3.70).

In the responses to the open-ended items, the respondents confirmed that there is shortage of resources like classrooms, text books, computers and school pedagogical centers. The availability and use of instructional materials affects the effectiveness of a teacher's lesson, which indirectly affects students' academic performance (Wakarindi, 2013). Accordingly, any trace of inadequacy leads to frustration among teachers and students, which negatively affects students' academic performance.

The top-most challenge rated to be very serious by the school leaders with mean (\bar{x} = 3.88), here, is lack of adequate training on school leadership and management for principals. The ideas of PTA members during FGD are summarized as follow with regard to this issue:

A principal, as an instructional leader, needs to treat student as a student and teacher as a teacher, if the aim is to bring about better academic performance among students; however, we do not think our school principals have succeeded in this area because most of them do not have adequate training in school management. Majority of them are subject teachers who were currently promoted to principal-ship position.

Similar to the above result, the finding of a study conducted by Yasser and Amal (2015) on teachers' perceptions of principals' instructional leadership in Omani schools indicated the need for principals to be trained in instructional leadership, especially in the field of managing instructional programs in their schools.

To sum, the challenges rated to be higher by respondents in table 4 require principals in the study area to exert more of their efforts to overcome the problems and promote students' performance.

Contrary to the aforementioned items, which were rated to be the highest hindering factors, items 3, 6 and 9 were rated by the respondents to be the lowest hindering factors that school principals encountered. These were indicated by the average mean computational results of 3.13, 3.58 and 3.18 respectively.

In general, as per the data from table 4, teaches indicated by their overall mean (\bar{x} = 3.64) that challenges hindering school principals from promoting students' academic performance do exist at the moderate level, while the school leaders rated the existence of these factors to be at the lowest level, with

the overall mean (\bar{x} = 3.57), as per the cut points previously set. In spite of the existence of opinion differences between the two groups, the calculated t-value ($t = .462$, $P = .649 > 0.05$) shows that there is no statistically significant opinion difference between the two groups.

In the interview conducted with them, the wereda education office expert (Exp 5) mentioned the following, which is summarized as follows:

We observed many challenges hindering principals from promoting students' academic performance. Among these, the most serious ones in our opinion are lack of pedagogical centers, less commitment on the part of the school community and lack of adequate training on school leadership and management.

As depicted by table 3 above, these three items are also rated to be high by the responses given to the quantitative data.

IV. CONCLUSIONS

School principals' role in improving students' academic performance in the target secondary schools of Sidama Zone was rated to be below average by teachers, school leaders and wereda education office experts. Weak supervision of school-based and national exams by principals paved ways to cheating during examinations. Principals have not adequately developed various programs to improve the quality of instruction. The respondents also opined that bringing about better academic achievement among students should have been the prime role of a school principal. Nevertheless, it was rated that principals' attempts in this area was below average. Among the hindering factors to students' academic achievement is large class size. It has been stressed by many writers that, as the class size increases, student achievement declines. However, principals' role in relation to this was rated to be inadequate. Most of the school principals do not have adequate training in school management and majority of them are subject teachers who were currently promoted to principal-ship position. As per the data from teaches, challenges hindering school principals from promoting students' academic performance do exist at the moderate level, while the school leaders rated the existence of these factors to be at the lowest level.

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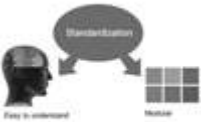




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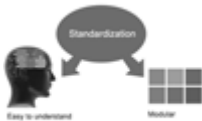


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8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

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11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice. Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.



21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

INFORMAL GUIDELINES OF RESEARCH PAPER WRITING

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.



- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.



Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.



Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.



Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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	A-B	C-D	E-F
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<i>Introduction</i>	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
<i>Methods and Procedures</i>	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
<i>Result</i>	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
<i>Discussion</i>	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
<i>References</i>	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring



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