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Realismo, Politica e Fundo Monetário Internacional

By Dr. Rodrigo Oliveira De Lima
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Resumo - Este artigo discute o realismo, especialmente no Fundo Monetário Internacional, a partir da crise de 2008, sobretudo nos princípios que fundamentam os fatores de segurança e cooperação. Destaca-se a questão da estabilidade financeira internacional através das Quotas e Reformas do FMI como recurso pleno a todos os países membros.

Palavras : chave: realismo, segurança, FMI.

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Realismo, Politica e Fundo Monetário Internacional

Dr. Rodrigo Oliveira De Lima

Resumo - Este artigo discute o realismo, especialmente no Fundo Monetário Internacional, a partir da crise de 2008, sobretudo nos princípios que fundamentam os fatores de segurança e cooperação. Destaca-se a questão da estabilidade financeira internacional através das Quotas e Reformas do FMI como recurso pleno a todos os países membros.

Palavras : chave: realismo, segurança, FMI.

Abstract - This article discusses the realism, especially the International Monetary Fund, from the 2008 crisis, especially the principles underlying factors of security and cooperation. We highlight the issue of international financial stability through shares and Reform the International Monetary Fund as a resource to all full members.

Keywords : realism, safety, IMF.

I. Introdução

Para o realismo internacional, algumas premissas tais como a complexidade no jogo de forças entre os países, a percepção dos fenômenos políticos na luta por prestígio, e o papel da negociação e cooperação internacional, constituem elementos basilares de seu sistema. No caso dos Organismos Internacionais, esses princípios também fundamentam os grandes fatores como os de segurança e paz. Nestas condições será possível dizer que há alguma tensão de poder numa instituição financeira como o Fundo Monetário Internacional?

A consolidação da Organização das Nações Unidas (ONU) e suas instituições financeiras, como o próprio FMI, Banco Mundial e os demais bancos de reconstrução do Pós-Segunda Guerra Mundial, sacralizou um novo espaço de acomodação das relações internacionais para o desenvolvimento basilar de políticas de países em desenvolvimento em fórum permanente por cooperação multilateral econômico-financeira. Aqui a multilateralização tornou propício na cooperação internacional, a existência de investimentos em títulos, como também em mercados financeiros estimulados no desenvolvimento de seus ativos, pelo Sistema Financeiro Internacional alicerçado na política externa dos Estados. A cooperação internacional transformou-se em plataforma de investimentos e adensou a produção de processos no FMI sobre Dívida Externa, Financiamentos Internacionais e Operações de Créditos Financeiros.

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Nesse caso, uma *política financeira* formou-se da importância capital da economia moderna, da projeção de crescimento econômico e consequentemente da função dos mercados financeiros, entendidos, como zona indispensável de atuação internacional. Os acordos financeiros têm estimulado através do desenvolvimento de competências o for talecimento do sistema e a confiança de sua capacidade em defender a manutenção da estabilidade internacional. A responsabilidade sistêmica é comungada por economias desenvolvidas, e não desenvolvidas através dessa *política financeira* que por sua vez opera na condição de *espinha dorsal* da economia moderna, com dependência de quase todos os outros setores econômicos, e fundamenta as projeções dos crescimentos econômicos como também a área de atuação do Estado nos mercados financeiros.

Quando um país se junta ao FMI, ele concorda em submeter suas políticas econômicas e financeiras ao escrutínio da comunidade internacional. Faz também um compromisso de prosseguir as políticas que são favoráveis ao crescimento econômico ordenado e de razoável estabilidade de preços, para evitar a manipulação de taxas de câmbio para vantagem competitiva e desleal, para desse modo fornecer dados sobre sua economia. O acompanhamento regular do FMI pelas economias e a respectiva prestação de assessoria política, se destina a identificar os pontos de convergência que visam à estabilidade econômica e financeira. Este processo é também um instrumento político conhecido como Surveillance. (MUSSA, 1995).

A vigilância financeira do país é um processo contínuo que culmina em periódicos (geralmente anuais), em consultas abrangentes com países-membros, com discussões entre eles conforme necessário. As consultas são conhecidas como *Consultas do Artigo IV.* Durante uma *Consulta do artigo IV*, uma equipe de economistas do FMI visita o país para avaliar a evolução econômica e financeira e discute políticas econômicas e financeiras com funcionários de seu Banco Central. Essas *missões* também reúnem parlamentares, representantes de empresas, sindicalistas e a sociedade civil. Temos por exemplo, em junho de 2007, a Reunião do Conselho Executivo do FMI em que foi aprovada a declaração política global de vigilância. A decisão de 2007 sobre Vigilância Bilateral sobre Políticas dos países membros

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completou o artigo IV e introduziu o conceito de *estabilidade externa* como um princípio organizador para a vigilância bilateral, naquilo que diz respeito à instituição. Isto significa que o foco principal das discussões entre o FMI e as autoridades do país está no aprofundamento dos debates sobre a estabilidade interna e externa da economia, sempre em reajustes cooperados, para a produção das perspectivas das tendências econômicas globais. (ALMEIDA, 2003).

Contudo ainda há a opção de realização de consultas multilaterais, envolvendo pequenos grupos de países, no intuito de promoção do debate e desenvolvimento de ações políticas destinadas a resolver os problemas de importância global ou regional. Por exemplo, em 2006, as consultas multilaterais reuniram a China e os países da área do Euro, mais o Japão, a Arábia Saudita e os Estados Unidos para a discussão sobre os desequilíbrios econômicos globais daquele período. No conjunto, os países se organizam interdependentes, com um objetivo comum que é o estabelecimento de regularidade das riquezas a partir das finanças depositadas no FMI. Aqui, já podemos apontar uma primeira vertente do realismo como materialização da política e tudo que decorre dela a partir de seu sentido objetivo. Se retomarmos em Raul Prebisch sua noção de centro e periferia no sistema internacional, veremos como os países são desafiados a produzir uma combinação em que a consciência precisa somar-se a força e a lucidez quando se trata de produzir estratégia em uma instituição financeira. (PREBISCH, 2006).

II. Quotas E Reformas

Mais recentemente, utilizamos as expressões *emergentes* e em *desenvolvimento* para países que são responsáveis pela maior parte do mundo em crescimento econômico. A demanda global agora depende, em grande medida, dessa relação. Além disso, alguns deles, nomeadamente os BRICS, tem sido uma fonte financeira de apoio ao FMI por meio de Quotas, acordos bilaterais e de suas participações no Novo Acordo de Empréstimo (NAB). Uma parte considerável dos recursos que o FMI tem em empréstimos nos últimos anos vem das reservas internacionais fornecidas pela China, Brasil, Índia, Rússia e outros países nessa classe. A deterioração das perspectivas para as economias avançadas é em grande parte causada pelos legados de problemas não resolvidos da crise financeira de 2008, incluindo alto desemprego, especialmente entre os jovens, a reforma inacabada do setor financeiro, a reparação incompleta do equilíbrio do orçamento doméstico, fonte perene de desregulação dos mercados. (COSTA, 2007) Estes problemas não resolvidos agravaram-se diante da insustentabilidade da dívida soberana, nomeadamente em alguns países da área do euro, e geraram volatilidade aguda nos mercados financeiros.

Os principais riscos em curto prazo para a economia global é a vulnerabilidade da Europa, particularmente a periferia da zona do euro. Os acontecimentos dos últimos anos confirmam essa percepção. Junto ao FMI e ao Banco Central Europeu, programas da União Europeia, devem ser fomentados para a estabilização da dívida pública, e o restabelecimento de segurança nos mercados financeiros. É da responsabilidade dos decisores políticos europeus a garantia de que as suas ações conterão o contágio para além da periferia do euro. A Europa tem hoje um papel crucial a desempenhar e precisa agir com rapidez e ousadia. (LAGARDE, 2012) As perspectivas para as economias avançadas permanecem em curto e mesmo em médio prazo bastante problemáticas. A consolidação orçamental, juntamente ao agravamento financeiro das empresas e dos consumidores sobre a oferta de crédito, pesou fortemente, sobre a economia. Austeridade fiscal que deverá prevalecer em médio prazo pode ser prejudicial à atividade econômica quando implementada simultaneamente em vários países, pois um número considerável deles tem como condição quase exclusiva a política fiscal contracionista. E isso não se aplica apenas a países que pediram apoio de emergência ao FMI e às autoridades europeias, mas já um contingente de outros países em franca crise aberta em seus Balanços de Pagamentos, já sem espaço fiscal para adoção de pacotes de estímulo. (IMF, 2012).

As economias avançadas parecem ter caído em uma armadilha de liquidez. A atuação da política monetária tem diminuído substancialmente. A expansão monetária deprimiria o valor externo de suas moedas com pouco efeito na recuperação econômica, causando consideráveis *dores de cabeça* para os países emergentes, produtores históricos dessas mesmas políticas. Dessa forma, há uma continuação de forças regendo o interior dos relacionamentos financeiros, retroalimentando a cooperação internacional. Pois a segurança e a vigilância sobre as operações financeiras, ainda que sob o domínio soberano de seus interesses, tem o *dever* de zelar a complexidade no jogo de forças entre os países.

É desta maneira, que as Quotas e as Reformas no Fundo Monetário Internacional tornam-se imprescindíveis para a legitimidade e a eficácia do órgão. Tanto os países emergentes como em desenvolvimento precisam se esforçar para obter parcelas cada vez maiores de Quotas, e assim responder de acordo com o seu peso na economia mundo. Em exemplo, nos anos de 2008 e 2010, acordos sobre Quotas e Reformas redefiniram o papel do FMI tanto em relação ao seu papel e atuação sobre

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crises financeiras, como também sobre a sua capacidade de relação com membros minoritários.

Contudo, a implementação da Quota de 2010 e as Reformas estão progredindo lentamente se considerarmos a transfiguração do poder de Quotas dos países emergentes e mesmo da capacidade de atuação em crises pelo FMI, agora amadurecida e densa após décadas de erros, ainda que recobertas de muitas críticas calcadas no fraco desempenho do órgão na crise dos Tigres Asiáticos, e de desvigorada reposta à crise dos anos de 1980, hoje corriqueiramente tratada com *a década perdida*.

É preciso avançar na prospecção de uma revisão global da fórmula de Quotas para 2013 com o compromisso de completar a próxima revisão geral de Quotas de Janeiro de 2014. Esta deve ser parte importante do contingente e governança, sobretudo para países como o Brasil, a Rússia, a Índia e a China. Não pode haver *backtracking* sobre este ponto. Uma vez que o aumento de Quota em 2010 tornou-se eficaz, o Brasil, por exemplo, será o décimo maior titular no Fundo. No entanto, o Brasil é atualmente a sétima maior economia no mundo, medido pelo PIB em ambas as taxas de mercado de câmbio ou de paridade de poder de compra. Na próxima revisão das Quotas, o Brasil pode subir no ranking em termos de Quota-parte e poder de voto no Fundo. O mesmo é válido para a Colômbia, a segunda maior economia do eleitorado do Brasil no órgão. Ainda nesse sentido, a próxima etapa da Quota e realinhamento de poder de voto deve combinar-se aos esforços do G20.

É preciso ainda lembrar que seu papel engloba diversos aspectos da natureza econômica nacional e internacional, bem como a) a *percepção* sobre o caráter global de crise financeira e de suas implicações sistêmicas, que realça a importância das economias emergentes e indica que eventuais soluções devem ser necessariamente compartilhadas pelas economias desenvolvidas; b) A necessidade de reformar e adaptar as instituições financeiras internacionais às novas características dos mercados globais, uma vez que se provaram inadequadas para lidar de forma ágil e eficiente com a atual crise financeira internacional; c) A importância do conceito de prevenção de crises e a necessidade de institucionalizar mecanismos capazes de evitar o fenômeno do contágio; d) A necessidade de estabelecer mecanismos de âmbito global para a implementação dos princípios relativos às atividades de supervisão e regulação dos sistemas financeiros nacionais; e) A adoção do gradualismo na promoção do movimento de liberalização da conta de capitais; f) O maior desenvolvimento do setor privado na prevenção e solução de crises.

Ainda que o FMI sofra pressões de seus maiores acionistas, a *Vigilância* é instrumento eficaz para a promoção de pontos de vista independentes estimuladores do debate mais diversificado e estratégico. Essa combinação deve ser encampada na perspectiva de vanguarda pelos países em desenvolvimento, para seu fortalecimento em relação ao amadurecimento de governança. A instituição deve ser reforçada para a promoção do *equilíbrio* em tomada de decisão, de modo a erradicar a percepção generalizada de que os principais países desenvolvidos subordinam sempre os demais países membros. É preciso ainda lembrar que isso depende crucialmente de uma nova redistribuição de Quotas e de poder de voto em favor dos países em desenvolvimento. A Reforma do Sistema Monetário Internacional, e do Sistema Financeiro Internacional depende do reconhecimento de seu papel transformador no processo entre a possibilidade e a realidade.

III. Considerações Finais

A recente experiência da crise de 2008 demonstrou que, em períodos de crise, a volatilidade dos mercados pressiona o aumento de recursos dos organismos financeiros internacionais (no caso do FMI, de Quotas e de DES), para que se ajustem em termos de capacidade de resposta às possíveis necessidades dos países membros num contexto de crise financeira. Este é o papel da *Surveillance* do Fundo, responsável pela *regulação* e *equilíbrio* internacional.

Há uma vigorosa expansão de negócios realizados entre os mercados e os Estados, em que a expansão de créditos, a realização futura de gastos de consumo e os investimentos têm produzido uma complexa engenharia financeira que por sua vez considera a complicação existente no jogo de forças entre as potências maiores e potências menores, sistematicamente nas estratégias: a) da necessidade de avaliação perceptiva sobre os fenômenos políticos na luta por prestigio internacional, embutidos nos liames da cooperação financeira internacional; b) do reexame do equilíbrio internacional avalizado também na popularização da política internacional; c) da necessidade da materialização da política, tacitamente, nos problemas de política objetiva, evitando, assim, a aspiração e a recidiva nos contratos de *refund* e de refinanciamentos no FMI; e) na premência e distinção do papel do FMI, estimando-o, sempre, como órgão produtor de autoridade dos Estados Unidos, na promoção da harmonia de interesses, em sua regularidade histórica de predomínio financeiro internacional como pressuposto à permanência de estabilidade.

Apesar da grande liquidez da economia mundial atualmente, a ideia fundamental continua sendo a de garantir a dotação desse recurso como também dos mecanismos necessários para a promoção dos seus objetivos tradicionais de ajuste das contas externas e de incentivo ao desenvolvimento dos países na relação com o FMI. Com referência à

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liberalização dos fluxos de capital, destacam-se as posições muito próximas dos países de economias emergentes a respeito da graduação e da adaptação do processo, de acordo com as realidades de cada país em particular, e a necessidade de os governos manterem seu direito de introduzir medidas que regulem a entrada de políticas para os investimentos de curto prazo para efeitos de *equilíbrio* de política macroeconômica. Para aqueles favoráveis a uma maior velocidade ao desenvolvimento da questão, apesar da convergência com relação ao princípio, *deve* haver consenso no que diz respeito a como deslanchar o processo sem que haja riscos para as economias envolvidas bem como para o sistema financeiro internacional como um todo. O único ponto relevante em comum para gerar uma decisão a favor, geralmente, se encontra na ideia de que a jurisdição a ser obtida pelo Fundo para tratar do tema está nas emendas ao seu Artigo IV.

No que concerne à capacidade da instituição de exercer tais funções, é de significativa importância, as decisões tomadas sobre a necessidade de aumento das Quotas e da dotação de Direitos Especiais de Saque (DES), que aumentarão significativamente a liquidez do Fundo; posição muito defendida pelo Brasil. A pequena participação do país na distribuição das Quotas será mais do que compensada com os benefícios da maior capitalização da instituição, que permitirá, por exemplo, que as intervenções do Fundo em momentos de crise aconteçam de maneira mais rápida e consistente, evitando-se, assim, maiores danos para a economia mundial, em geral, e para a economia dos países diretamente afetados, em particular.

Cabe notar ainda que a ideia e a criação de mecanismos regionais de proteção contra crises, uma espécie de Fundo Regional e de *Regional Surveillance* podem contribuir com o FMI no encaminhamento de soluções, incluindo a alocação de recursos, em momentos de conturbação econômica em uma determinada região, de modo a permitir a recuperação mais rápida do país afetado por uma crise, e a fim de evitar que os efeitos adversos da mesma se alastrem pelas economias vizinhas. Cabe ao FMI o papel de auxiliar países em momentos de crise, sendo que, justamente, para aprimorar esta função foi vívida sempre a ideia de aumento dos DES no âmbito da instituição. Em relação a este ponto a posição do Brasil tem sido a de defesa de uma postura proativa por parte do FMI. Nesse sentido, vale ressaltar a manutenção do grande interesse dos investidores e das instituições financeiras internacionais pelo Brasil, evidenciado pelo grande número de audiências solicitadas por representantes daqueles grupos a diferentes autoridades do Ministério da Fazenda e do Banco Central geralmente em oferta e lançamento de títulos do governo brasileiro no mercado externo, de investimentos e de participações diretas na economia brasileira, o que demonstra o crescente interesse que o país vem exercendo no capital externo.

Enfim, o fato é que esse setor externo tem dado grandes provas de confiança na continuação da estabilidade monetária e cambial, bem como na manutenção de taxas de crescimento econômico sustentável. Para isso, tem sido fundamental a consistência e a transparência da política macroeconômica que vem sendo adotada, baseada nos princípios de política monetária restritiva, política cambial flexível e comércio exterior favorável.

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Credit Analysis of Emerging Economics Energy Distribution Company of Peru

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Abstract - The case focuses in evaluation of a Peruvian company called "The Energy Distribution Company of Peru – DEPSA". This company has several lines of financing (credit lines or credit facilities) in order to cover their operations in the short and long term. In the last board meeting, they (the board members) agreed that DEPSA should continue with the current financing politic for their operations, focusing on the next 12 months in the short term. In order to confirm the possibility of continuing with that politic, the finance manager had to coordinate with the main bank, the evaluation through a credit analysis and ask for a renewal of its credit lines first in front of the respective financial institution.

In addition, the board asked that the regulatory area explains, on the next session, how the Electricity Sector works in Peru does and who are the main actors and stakeholders of the business.

Keywords : electricity sector, financial strategies, financial statements analysis, ratios, dupont, profitability and risks.

GJMBR-C Classification : JEL Code: E51



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Credit Analysis of Emerging Economics Energy Distribution Company of Peru

Alfredo Mendiola [α], Edmundo R. Lizarzaburu [σ] & Julio Quispe [ρ]

Abstract - The case focuses in evaluation of a Peruvian company called "The Energy Distribution Company of Peru-DEPSA". This company has several lines of financing (credit lines or credit facilities) in order to cover their operations in the short and long term. In the last board meeting, they (the board members) agreed that DEPSA should continue with the current financing strategy for their operations, focusing on the next 12 months, it means in the short term. In order to confirm the possibility of continuing with that strategy, the finance manager has to coordinate with their main bank, the evaluation through a credit analysis and ask for a renewal of its credit lines, considering the respective financial institution.

In addition, the board asked that the regulatory area explains, on the next session, how the Electricity Sector works in Peru does and who are the main actors and stakeholders of the business.

Keywords : electricity sector, financial strategies, financial statements analysis, ratios, dupont, profitability and risks.

I. Introduction[1]

The Energy Distribution Company of Peru has requested a revision and expansion of their commercial credit lines and the Chief Risk Officer of EMERGING Bank[2], has requested to its senior analyst Mr. Fausto Menlizqui to make an economic – financial analysis of the Energy Distribution Company of Peru with the purpose of evaluation the renewal and expansion of their credit facilities.

The process of analysis will take him at least 2 weeks, considering the uprising and recollection of information, the data processing and the elaboration of the company's analysis profile. The information will be obtain through several sources of the Peruvian market (Stock Market of Lima, CAVALI, SUNAT, Conasev today known as the Superintendence of the Securities Market – SMV, and others) and the information will be audited and commercial that the company will bring, that is also on the Conasev web page (today SMV) since their stocks are listed on the Stock Market of Lima.

After checking some documents, Mr. Fausto Menlizqui required a meeting with Mr. Ernesto Valdez, Chief Financial Officer of the Energy Distribution Company of Peru, with the purpose of talking about the information that was going to be processed and analyzed. The meeting was made before the credit report. The meeting will be on summer 2011.

At the meeting, Mr. Valdez comments a little about the sector and the company's history, mentions some things about the growth in the Peruvian market (there's a construction boom[3] in Peru, where before there was one house – one light meter, now there are in average buildings of 15 apartments – 15 light meters and also a light meter of the building itself).

II. Electricity Sector in Peru[4]

As in all investments, the access to the sector's information is a key variable to consider, especially everything about the legal and regulatory aspects.
The industry of electric energy in Peru is divided into:

a) Generation, that consists on the creation of energy through several sources, among which water, natural gas, coal and oil are the most important,
b) Transmission, the electricity is transported through transmission lines to the substation, those substations convert high voltage electricity into less voltage electricity, and
c) Distribution, in which the electricity is taken from the substation to houses, offices and factories.

As shown below on Table 1. The electric energy consumption per capita and on Graphic 1 Evolution of electric energy per capital the growth have been constant on the last 15 years and, apparently, it will continue with this increasing trend on the next years. This information can be used to compare the growth trend of consumption against sales growth and the company's margin.

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[1] Class & Asociados S.A. Pacific Credit Rating.
[2] Peruvian bank, the name was modified for this evaluated case..
[3] Source: Newspaper Perú 21, Chamber of Commerce of Lima, October 2011.
[4] Class & Asociados S.A. Pacific Credit Rating.

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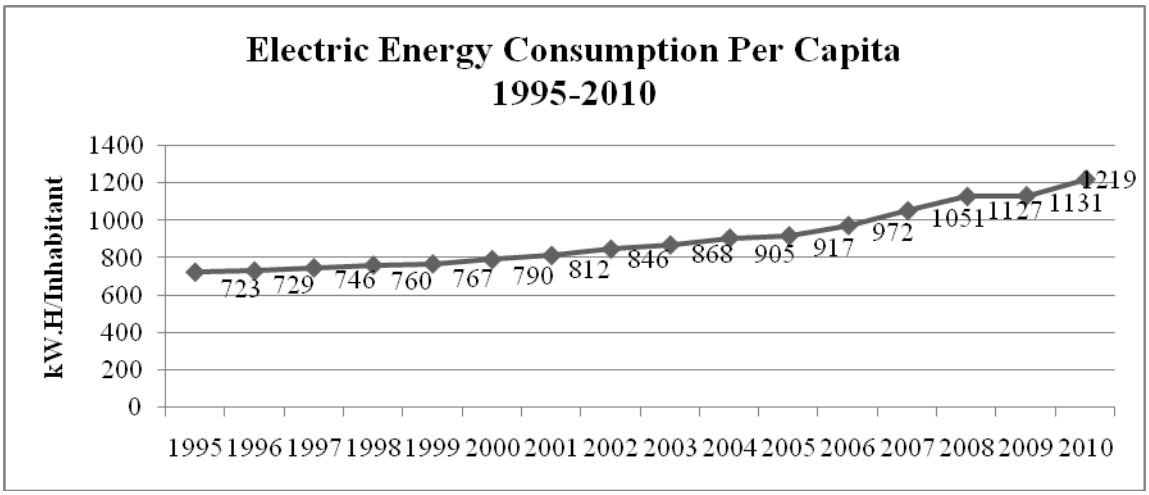
Table 1 : Electric Energy Consumption Per Capita

Year	kW.h/inhabitant
1995	584
1996	603
1997	625
1998	645
1999	656
2000	680
2001	711
2002	737
2003	755
2004	794
2005	805
2006	854
2007	929
2008	1002
2009	999
2010	1079

Growth 10/09	8%
Average Variation 10/05	6%
Growth 10/00	59%
Average Variation 10/00	5%

Graphic 1 : Evolution of Electric Energy Consumption Per Capita



Also, the production of electric energy during the last 15 years has had the same trend as consumption. The Table 2 Production of Electric Energy Per Capita and Graphic 2 Evolution of the Production of Electric Energy Per Capita show what was mentioned.

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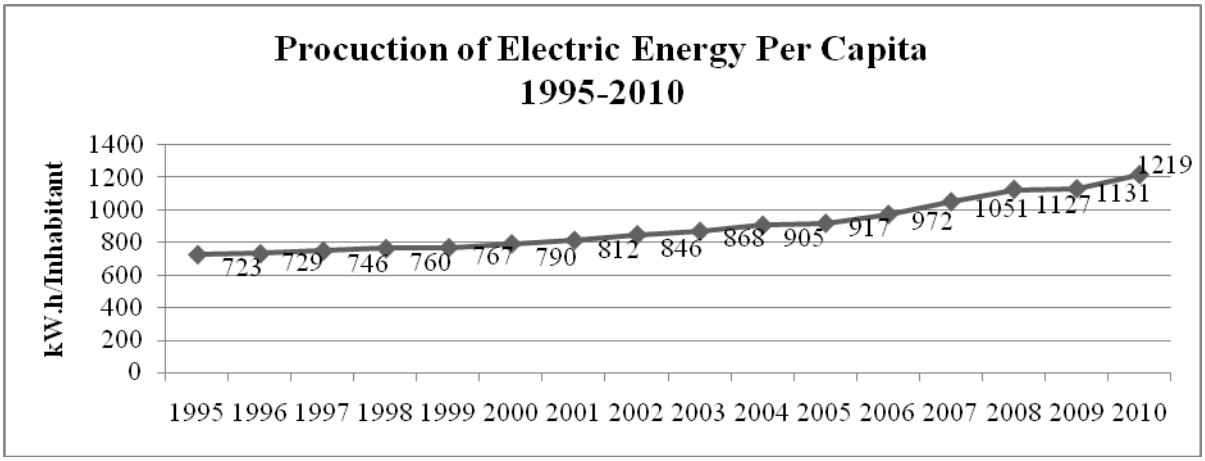
Table 2 : Production of Electric Energy Per Capita

Year	kW.h/inhabitant
1995	723
1996	729
1997	746
1998	760
1999	767
2000	790
2001	812
2002	846
2003	868
2004	905
2005	917
2006	972
2007	1051
2008	1127
2009	1131
2010	1219

Growth 10/09	8%
Average Variation 10/05	6%
Growth 10/00	54%
Average Variation 10/00	4%

Graphic 2 : Evolution of the Production of Electric Energy Per Capita



In order to have more details of the sector, Mr. Fausto Menlizque coordinated with the regulatory area of Emerging Market, where Dr. Macarena Lizquerri attended him. This information is shown of Annex 1 of this case.

III. Background of the Company and Operations

Fausto, has shown interest on the explanation of the sector, but considered relevant to understand the operation of the company and know as much as possible about the financial situation of the company on the last years.

In order to do that, he checked the web page of the Stock Market of Lima (www.bvl.com.pe) and CONASEV (today known as SMV www.smv.gob.pe) and the information given by the company. The detail of its stock prices (stock's information and details of the bonds in circulation) is shown on Annex 2 of this document. On those pages he found important

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information about financial statements, cash flow and prices of several instruments that the company has, now, DEPSA.

Is important to mention some relevant aspects about the history of the company in study, which is a member of Endesa group. The Electric Distribution Company of Peru started its operation in March 1934. Its principal objective is to make activities of distribution and commercialization of electric energy, on a competitive background and free market according to the standards that are valid on the Peruvian market. Nowadays, the company works on 52 districts in Lima and Callao (Peru) with a total of 2,440 km^2 in which 1,838 km^2 are on the north of the capital city. In addition, it works at the provinces of Huaura, Barranca and Oyon.

In accordance with the provisions of the law and in addition to its social object, in 2006 the company started, on its concession area, the sales of electric artifacts and insurances (multiple insurances, burial insurances and family protection insurances). All of those services are targeted to clients with medium and low sizes of income; they are added an additional charge on their receipts.

Since 1998, DEPSA has a contract of energy purchase and the contracted power with the company Edegel SAA has a maximum capacity of 145MW and a length of 13 years. Since 2007 the company has made several tenders on the base of the Law 28832 with the purpose of ensure the supply of electric energy to its free clients and regulated on the short term (2008-2013) as well as on the long term (2014-2025). As a result of the tenders the company has sign several contracts (more than 100) electric energy supply; in which, between 20 and 25, were signed with Edegel SAA and the minimum power contracted was 0.3 MW and a maximum of 275MW.

DEPSA is a member of Endesa group, which a leader company of the Spanish electric market, one of the five biggest in Europe and on the main private electric companies in Latin America. Its main business is to produce, transport, distribute and commercialize electric energy. In addition, it has an increasing presence on the Iberian market of natural gas and develops other services that add value to their main business. Under the acquisition of Endesa by the Italian group Enel, the biggest electric company in Italy and the second Italian operator of natural gas, the Energy Distribution Company of Peru is now part of the second electric company with major installed capacity of the world, with a presence on 23 countries of the 4 continents and has 96,000 MW of installed capacity and 60.8 million clients in generation and electric and gas distribution. In addition, they have an increasing presence on the Iberian market of natural gas and develops other services that add value to its main business and has a characteristic support of its operation and several offices around the world.

a) Commercial Management

At the end of 2010, 1,043,924 clients were registered, which represented an increase of 2.4% regarding December 2008, highlighting an increase on the residential segment with 1.9%. Below Charter N°1 Commercial Management shows in detail the types of clients and the energy consumption they totalize, at the closure of 2010.

Chart No. 1 : Commercial Management[5]

Type	Energy Billed		Type	Number of clients	
	Mwh	MS/.		Quantity	%
Residential	1,068,002	371,094	Residencial	982,628	94.13
Commercial	575,512	136,108	Comercial	40,979	3.93
Industrial	590,621	123,649	Industrial	963	0.09
Others	390,550	121,989	Otros	19,344	1.85
Toll	212,487	4,080	Peaje	10	0
Total	2,837,172	756,920	Total	1,043,924	100

Source : Energy Distribution Company

b) Relationship between the Company and the Government

As an electric sector company, DEPSA is under the supervision of OSINERGMIN[5] regarding the fulfillment of legal dispositions applicable and attached to its electric activities; being the organization in charge of penalize and solve in last administration instance the matters attached to those legal dispositions. In addition, OSINERGMIN controls the fulfillment of environmental obligations in charge of the emitter, in this case the Energy Distribution Company of Peru.

IV. Financial Situation[6]

The financial information selected was obtained on the financial statements of DEPSA, which are shown on its memories of the years 2006 to 2010, on the dates and for every period indicated on this section. Fausto

[5] Supervosiry agency of investment in energy and mining.

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started the analysis the information of the Financial Statements, through some methods and obtaining the behavior of the main accounts.

Charter N° 2 : Composition of Assets 2010

	2010
ASSET	
CURRENT ASSET	
Cash and Cash equivalent	158,548.00
Commercial Receivables (net)	251,233.00
Other receivables of relate parties (net)	1,922.00
Other receivables (net)	16,117.00
Inventories	24,909.00
Expenses contracted in advance	4,299.00
TOTAL CURRENT ASSET	**457,028.00**
NON CURRENT ASSET	
Financial investments	10,946.00
*Other financial investments	-
Commercial receivables	990.00
Property investments	-
Property, machinery and equipment	2,171,321.00
Intangible Assets (net)	14,227.00
Other assets	-
TOTAL NON CURRENT ASSET	**2,197,484.00**
TOTAL ASSET	**2,654,512.00**

Source : SMV

Charter N° 3 : Composition of Liabilities 2010

	2010
LIABILITIES	
CURRENT LIABILITIES	
Bank overdraft	-
Financial obligations	116,324.00
Commercial Payables	221,688.00
Other payables of related parties (net)	8,316.00
Income tax and current participations	19,254.00
Current payables	73,791.00
Provisions	31,158.00
TOTAL CURRENT ASSET	**470,531.00**
NON CURRENT LIABILITIES	
Financial obligations	885,602.00
Liabilities of income tax and differed shares	367,490.00
Other liabilities	2,593.00
TOTAL NON CURRENT ASSET	**1,255,685.00**
TOTAL ASSET	**1,726,216.00**

Source : SMV

[6] The information shown had been obtained on the memories of the company and the web pages of the Stock Market of Lima-BVL and the Superintendence of Securities Market – SMV.

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This information, Charter N° 2 Composition of Assets 2010 and Charter N° 3 Composition of Liabilities 2010, for the specialist of the Emerging Bank are not relevant from the financial analysis perspective. According to Fausto, this is because it is necessary to analyze the behavior of the company on a period of time, this being between 3 and 4 years. Because of this, Fausto requires the audited financial statements of the periods 2006, 2007, 2008 and 2009 with the purpose of processing the accounts and elaborating a credit report.

The financial statements of the Profit and Lost Statement and the Balance sheet of the last 5 years of DEPSA are shown on Charter N° 4 Income Statement and on Charter N° 5 Balance Sheet.

Charter N° 4 : Income Statement (thousands of dollars)

	2006	2007	2008	2009	2010
Net sales	1,293,308.00	1,290,877.00	1,389,236.00	1,563,921.00	1,618,644.00
Other operational incomes	24,356.00	58,593.00	49,785.00	66,744.00	93,391.00
Total gross revenue	**1,317,664.00**	**1,349,470.00**	**1,439,021.00**	**1,630,665.00**	**1,712,035.00**
Cost of sales (operationals)	-968,223.00	-943,955.00	-992,268.00	-1,139,940.00	-1,167,341.00
Other operational costs	-14,633.00	-41,865.00	-37,845.00	-52,264.00	-71,843.00
Total of operational costs	**-982,856.00**	**-985,820.00**	**-1,030,113.00**	**-1,192,204.00**	**-1,239,184.00**
Gross Income	**334,808.00**	**363,650.00**	**408,908.00**	**438,461.00**	**472,851.00**
Sales expenses	-68,428.00	-65,299.00	-58,140.00	-58,453.00	-61,201.00
Administrative expenses	-63,751.00	-56,148.00	-59,875.00	-63,485.00	-66,438.00
Profit (loss) on sale of assets	-	-952.00	13,316.00	-634.00	-117.00
Other incomes	15,612.00	18,452.00	11,203.00	12,165.00	11,656.00
Other expenses	-5,198.00	-12,062.00	-7,093.00	-4,459.00	-4,224.00
Operative income	**213,043.00**	**247,641.00**	**308,319.00**	**323,595.00**	**352,527.00**
Financial income	21,482.00	17,776.00	26,099.00	24,562.00	14,244.00
Financial expenses	-65,863.00	-72,021.00	-92,076.00	-78,245.00	-73,032.00
EBIT	**168,662.00**	**193,396.00**	**242,342.00**	**269,912.00**	**293,739.00**
Workers participation	-10,296.00	-10,449.00	-13,128.00	-14,566.00	-15,236.00
Income tax	-59,409.00	-61,075.00	-74,827.00	-84,728.00	-87,087.00
Net profit (loss) of ongoing activities	98,957.00	121,872.00	154,387.00	170,618.00	191,416.00
Net profit (loss) of exercise	**98,957.00**	**121,872.00**	**154,387.00**	**170,618.00**	**191,416.00**
Net profit (loss) basic for common share	**0.119000**	**0.166000**	**0.242000**	**0.270000**	**0.300000**
Net profit (loss)diluted per common share	**0.119000**	**2.327051**	**0.242000**	**0.270000**	**0.300000**

Source : SMV

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Charter N° 5 : Balance Sheet (thousands of dollars)

	2006	2007	2008	2009	2010
ASSET					
CURRENT ASSET					
Cash and cash equivalent	18,808.00	16,605.00	34,321.00	45,169.00	158,548.00
Commercial receivables (net)	180,197.00	208,802.00	221,801.00	227,982.00	251,233.00
Other receivables of related parties (net)	5,635.00	3,061.00	1,969.00	1,784.00	1,922.00
Other receivables (net)	6,321.00	14,486.00	37,074.00	14,363.00	16,117.00
Inventory (net)	27,903.00	16,077.00	31,455.00	22,455.00	24,909.00
Expenses contracted in advance	4,775.00	1,679.00	2,752.00	3,001.00	4,299.00
TOTAL CURRENT ASSET	**243,639.00**	**260,710.00**	**329,372.00**	**314,754.00**	**457,028.00**
NON CURRENT ASSET					
Financial investments	118.00	3,901.00	12,276.00	9,392.00	10,946.00
*Other financial investments	5,822.00	-	-	-	-
Other receivables	-	3,446.00	5,709.00	1,798.00	990.00
Property, machinery and equipment (net)	1,937,906.00	1,945,725.00	2,020,245.00	2,107,664.00	2,171,321.00
Asset for Income Taxes and deffered shares	17,741.00	19,705.00	18,416.00	17,451.00	14,227.00
TOTAL NON CURRENT ASSET	**1,961,587.00**	**1,972,777.00**	**2,056,646.00**	**2,136,305.00**	**2,197,484.00**
TOTAL ASSET	**2,205,226.00**	**2,233,487.00**	**2,386,018.00**	**2,451,059.00**	**2,654,512.00**
LIABILITIES					
CURRENT LIABILITIES					
Bank overdraft	412.00	1,707.00	-	107.00	-
Financial obligations	205,280.00	260,336.00	151,447.00	84,865.00	116,324.00
Commercial payables	101,123.00	107,637.00	135,158.00	139,773.00	221,688.00
Other payables of related parties (net)	14,652.00	15,979.00	20,826.00	9,949.00	8,316.00
Income tax and current participations	78,045.00	27,202.00	29,248.00	15,049.00	19,254.00
Other payables	40,936.00	47,644.00	50,566.00	68,087.00	73,791.00
Provisions	13,774.00	13,072.00	32,361.00	32,456.00	31,158.00
TOTAL CURRENT LIABILITIES	**454,222.00**	**473,577.00**	**419,606.00**	**350,286.00**	**470,531.00**
NON CURRENT LIABILITIES					
Financial obligations	386,455.00	509,541.00	711,736.00	853,849.00	885,602.00
Liabilities of income tax and differed shares	481,957.00	434,260.00	410,242.00	389,519.00	367,490.00
Other payables	3,706.00	2,994.00	3,110.00	2,263.00	2,593.00
TOTAL NON CURRENT LIABILITIES	**872,118.00**	**946,795.00**	**1,125,088.00**	**1,245,631.00**	**1,255,685.00**
TOTAL LIABILITIES	**1,326,340.00**	**1,420,372.00**	**1,544,694.00**	**1,595,917.00**	**1,726,216.00**
NET EQUITY					
Capital	738,564.00	638,564.00	638,564.00	638,564.00	638,564.00
Unrealized income	118.00	-	-	-	-
Legal reserve	132,409.00	3,901.00	12,276.00	6,246.00	7,280.00
Other reserves	-	133,188.00	133,188.00	133,188.00	133,188.00
Retained earnings	7,795.00	37,462.00	57,296.00	77,144.00	149,264.00
TOTAL NET EQUITY	**878,886.00**	**813,115.00**	**841,324.00**	**855,142.00**	**928,296.00**
TOTAL LIABILITIES AND EQUITY	**2,205,226.00**	**2,233,487.00**	**2,386,018.00**	**2,451,059.00**	**2,654,512.00**

Source : SMV

V. Credit Lines

The company works with 4 local financial entities[7] with its principal bank Banco de Credito del Peru with more than 50% of their direct and indirect obligations with banks.

In addition, BBVA and Banco Interbank are relevant. The company also finances its obligations on the capital market (between 70% and 80%) since there they have good rates conditions that they obtain from investors. The principal products DEPSA uses on the financial market are: letters of guarantee, treasury operations, medium-term note and leasing transactions.

[7] Source: Risk centers

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Fausto has access to the total amount of exposition with the bank and it is of US$ 180 MM, where 50% are letters of guarantee (tenders, complaints to SUNAT[8], others), and the other 50%is distributed on a similar way between the other three products, which mean what is important for DEPSA is to renew and extend the lines of the letters of guarantee and treasury operations. The other operations are being cancelled with no delay.

The amount of the letters of guarantee generate, for the bank, are commission incomes between 0.15% and 1% of the amount of the letter of guarantee. The treasury operations are mainly of exchange rate, since the company has to pay its obligation with a foreign currency and its incomes are mainly with the local currency.

VI. Questions

Fausto already has the whole information and has to present the report to the board, and you have to collaborate with the analysis doing the math, being the most important:

- Vertical and horizontal analysis
- Ratio analysis: solvency, liquidity and management.
- Dupont analysis

1. With this information, which are the strengths and weaknesses of Energy Distribution Company of Peru?
2. From the analysis, what does the numbers of the company show?
3. About the sources of financing of the company, where do they obtain most part of their resources?
4. Should the financial entities renew and extend the credit lines of the company?

Additionally, and since there is information, the student is require to make a referential review of the EVA.

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Annex N ° 1 – the electricity sector in Peru[9]

Regulatory framework of the Electricity Sector

Inside the most representative characteristics of the Peruvian regulatory model for the development of electric activities are:

- Segmentation in three activities: generation, transmission and distribution.
- Self-determination of generation prices (power and energy) for the electric supply to Free Users.
- Generator electricity sales to distributors to attend the Public Service of Electricity through: a) bilateral contracts with the Busbar Tariff that the article 47° of the Electricity Concessions Law is referred, or, b) firm price contracts, resulting from tenders referred to the Law N° 28832.
- The tariff transmission regulation and the distribution of every type of supplies.
- Private management of the interconnected electric system operations under efficiency principles, minimizing costs and quality guarantee and reliable supply of electricity.

Structure of the Electricity Sector

The electricity sector in Peru is divided in three sub-sectors: generation, transmission and electricity distribution. The **generation activities** can be developed by companies that generate electricity using hydraulic resources or geothermal or fuel. The **transmission activities** are generally developed by companies that transmit the energy produced by generation companies for the sale of this to third parties. The **distribution activities** of electricity are developed by distribution companies that acquire electricity from the generation companies for the sales of this to the final clients that can be free or regulated.

The Law of Electric Concessions establishes as the main principle the division of the activities that are from the electricity sector in a way that more than one activity (generation, distribution and transmission). This allows the existing companies that are related in different activities but the same company cannot do both two activities at the same time.

Under the terms of the Antimonopoly and Antioligopoly Law of the Electricity Sector, the vertical and horizontal integration of the activities mentioned before need to have a previous authorization in charge of the Free Competence Committee of the National Institute of Defense of Competition and the Protection of Intellectual Property (INDECOPI), when some of the target parameters established on the norm are overcome. Furthermore, the Law of Electric Concessions allows vertical integration on the cases of isolated systems where the same company is in charge of more than one activity.

When the electric power is transmitted from the generator to the distributor, is divided into two types of clients:

- **Regulated clients:** Around 4.6 millions of users[10] (supplies) with a maximum demand less or equal to 250Kw per supply[11]. If the demand is between 250Kw and 2500Kw they freely choose if it is a regulated or a free client.
- Free clients: 258 big electricity consumer (important mining complexes, commercial and industrials) with a potential demand equal or superior to 2,500Kw[12].

Participants of the Electricity Sector

Ministry of Energy and Mines (MINEM): is a governing body of Energetic and Mining Sector that meets regulatory work. Has a mission to promote the sustainable and competitive development of energetic and mining activities ensuring the supply of energy in an effective and efficient way. Furthermore, they are in charge of enforcing the valid legal framework (Law of Electric Concessions) and its function is to conduct the medium and long term energetic politics oriented to the optimum use of the resources without prejudicing the environmental background. It is important to mention that MINEM is the only agency the power of ceding so they give concessions and authorization to participate on the electric business in the Country.

Supervision System Energy Investment: this system is composed by these institutions: Supervisory Agency of Investment in Energy and Mining (OSINERGMIN), which monitors, supervises and regulates the activities made by the energy sector, they regulate the tariffs and sets the different prices regulated by the electronic service; INDECOPI, is in charge of regulating free competence; and finally, the Deputy Manager Rate Regulation (GART), which is in charge of setting tariffs.

Committee on Economic Operation of the System (COES-SINAC): technical agency which

[9] At the moment of the study, at the beginning of 2011.

[10] According to the Ministry of Energy and Mines.

[11] According to the Ministry of Economy the regulated clients are 4'624,534.0

[12] Source: Pacific Credit Ratings. Sector report – Peru: Electricity Sector (17.01.2011).

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purpose is to coordinate the operation at the minimum cost, security guarantee and quality of the provision of electric energy and the best use of energetic resources. Is composed by the generation power holders and transmission systems whose installations are interconnected on the National System.

Electric Companies: the electric companies are the ones that are in charge of generation, transmission or distribution of electric energy to the economic agents that demand that resource. According to the Ministry of Energy and Mines, there are 22 generator companies, 7 transmission companies and 23 distribution companies.

Regulators and Supervisor Agencies

The generation, transmission and distribution activities of electricity in Peru are regulated by the Law of Electric Concessions and its regulation. On the legal framework of the sector, there are two entities (The Ministry of Energy and Mines – MINEM – and the Supervisor Agency of Investment on Energy and Mining – OSINERGMIN -) in charge of look after the implementation and fulfillment of the applicable norms to the electric sector activities.

- MINEM establishes the general politic of the sector, regulates the matters related to environmental protection and the grant, supervision and termination or caducity of authorizations and concessions for the development of the generation, transmission and distribution of electricity activities.
- OSINERGMIN looks after the fulfillment of the dispositions contained on the applicable laws for the activities of the sector and sanction the ones that not meet what is regulated on the Regulation of Supervision of Energetic Activities.

Energy Demand

During 2010 the total production of energy of the system was of 35,764 GWh, which represents a growth of the electric demand at a national level of 9.4% with respect of 2009, according to the preliminary number published by the Ministry of Energy and Mines[13].

The demand of electric energy in Peru has grown in 8.1%, with respect of 2009, while the Distribution Company of Peru did in 7.4%.

A growth of the demand have been registered (energy purchase), without including toll of 7.0%. About the maximum potencies (without toll) had grown 5.04% with respect of the maximum demand registered in 2009.

Tariffs

According to the Law of Electric Concessions, for the supply of Public Electricity Service (Regulated Users) and Free Users, different princes have been established b OSINERGMIN[14].

The sales of electricity that are made by generation companies to the distribution companies fluctuates at the tariff applicable that was established by OSINERGIN for the respective point (Bar) of deliver (Bar Tariff). The Bar Tariffs are composed by the Price of Power Point in Bar, the Price of Energy in Bar, the charges of the principal system's transmission and the loss determine by each bar of the interconnected system. The tariffs in Bar are the maximum princes of electricity acquire by distribution companies that they can move to its Regulated Users.

[13] MINEM numbers.

[14] Peruvian regulator of the electric sector.

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Annex N° 2 : Components of the Regulated Tariff

Components		Participation (%)	Tariff	Regulation Periods
Generation	Energy	36.40%	Tariff in Bar	Is regulated annually and the periods tariffs are set between May and April of the next year. The evaluation considers the demand and offer of 2 years in the future over the base of the previous year at March 31st of every year.
	Power	14.10%		
Transmission	Principal System of Transmission	13.30%		
	Secondary System of Transmission	3.50%	Tariff for Secondary Systems of Transmission (SST)	Is regulated every 4 years. The last regulation entered into force in May 2007 and will end on 2011.
Distribution	Added value of distribution	32.70%	Tariff of distribution (VAD)	Is regulated every 4 years. The last regulation entered into force in November 2009 and will end on October 2013.
Total Regulated Tariff		100.00%		

Source : OISNERGMIN

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Selection of Best ARIMA Model for Forecasting Average Daily Share Price Index of Pharmaceutical Companies in Bangladesh: A Case Study on Square Pharmaceutical Ltd.

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Abstract - This work is an attempt to examine empirically the best ARIMA model for forecasting. Average daily share price indices of the data series of Square Pharmaceuticals Limited (SPL) have been used for this purpose. At first the stationarity condition of the data series are observed by ACF and PACF plots, then checked using the Statistics such as Ljung-Box-Pierce Q-statistic and Dickey-Fuller test statistic. It has been found that the average daily share price indices of the data series of Square Pharmaceuticals Limited (SPL) are non-stationary. The average daily share price indices of SPL data series are non-stationary even after log-transformation. But after taking first difference of logarithmic values of SPL data series, the same types of plots and the same types of statistics show that the data is stationary. The best ARIMA model have been selected by using the criteria such as AIC, AIC_c, SIC, AME, RMSE and MAPE etc. To select the best ARIMA model the data split into two periods, viz. estimation period and validation period. The model for which the values of criteria are smallest is considered as the best model. Hence, ARIMA (2, 1, and 2) is found as the best model for forecasting the SPL data series.

GJMBR-C Classification : JEL Code: F37



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Selection of Best ARIMA Model for Forecasting Average Daily Share Price Index of Pharmaceutical Companies in Bangladesh: A Case Study on Square Pharmaceutical Ltd.

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Abstract - This work is an attempt to examine empirically the best ARIMA model for forecasting. Average daily share price indices of the data series of Square Pharmaceuticals Limited (SPL) have been used for this purpose. At first the stationarity condition of the data series are observed by ACF and PACF plots, then checked using the Statistics such as Ljung-Box-Pierce Q-statistic and Dickey-Fuller test statistic. It has been found that the average daily share price indices of the data series of Square Pharmaceuticals Limited (SPL) are non-stationary. The average daily share price indices of SPL data series are non-stationary even after log-transformation. But after taking first difference of logarithmic values of SPL data series, the same types of plots and the same types of statistics show that the data is stationary. The best ARIMA model have been selected by using the criteria such as AIC, AIC_c, SIC, AME, RMSE and MAPE etc. To select the best ARIMA model the data split into two periods, viz. estimation period and validation period. The model for which the values of criteria are smallest is considered as the best model. Hence, ARIMA (2, 1, 2) is found as the best model for forecasting the SPL data series. Then, forecasts of the data have been made using selected type of ARIMA model. Finally, the values of ADSPI of SPL up to February 2012 are predicted and reported in the study.

I. Introduction

Stock exchange plays a vital role in the national economy of Bangladesh. Stock market is an essential part of the capital market. The economy of a country largely depends on capital market. In the capital market the investors invest the money to get the profit. The investors buy the security bond of different company on the priority basis. They choose the security bond of different company on the basis of the different factors. Some of the significant factors are Company's information analysis & prediction, dividend declaration, etc. A large amount of investors has no knowledge about the market analysis and proper prediction of the future prices of different types of shares available in the market. So, most of the time they spend the money to buy security bond of different companies on the basis of wrong and thumb idea, without any idea about data analysis and prediction.

For this reason there are extreme ups and downs in the daily share price indices, sometimes rise very quickly and fall sharply. In this situation, the market condition becomes unpredictable. Hence, a large amount of investors loss their capital in this unstable capital market. As a result the general investors do not find interest to invest the money in the capital market. Then there arises a crisis in the capital market which creates problem and hampers the national economic growth.

Therefore, if it is possible to provide a better model for the share market which can enable the investors to predict the prices in advance, it would help the investors as well as keep stability of the national economy. This study is an effort towards that direction.

II. Literature Review

Contreras et al. (2003) used ARIMA models to predict next day electricity prices; they have found two ARIMA models to predict hourly prices in the electricity markets of Spain & California. The Spanish model needs 5 hours to predict future prices as opposed to the 2 hours needed by the Californian model. Kumar et al. (2004) used ARIMA model to forecast daily maximum surface ozone concentrations in Brunei Darussalam. They have found that ARIMA (1, 0, 1) was suitable for the surface O_3 data collected at the airport in Brunei Darussalam. Tsitsika et al. (2007) used ARIMA model to forecast pelagic fish production. The final model selected were of the form ARIMA (1, 0, 1) & ARIMA (0, 1, 1).

Azad et al. (2011) used ARIMA model in forecasting Exchange Rates of Bangladesh. By using Box Jenkins methodology they tried to find out best model for forecasting. They have found that ERNN (exchange rate neural network) model shows better performance than ARIMA. Merh (2011) used ANN & ARIMA models in next day stock market forecasting. They used ANN (4-4-1) and ARIMA (1, 1, and 1) for forecasting the future index value of sensex (BSE 30).

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The forecasting accuracy obtained for ARIMA (1,1,1) is better than ANN(4-4-1). Liv et al. (2011) used ARIMA model in forecasting incidence of hemorrhagic fever with renal syndrome in China. The goodness of fit test of the optimum ARIMA (0, 3, and 1) model showed non-significant autocorrelation in the residuals of the model.

Datta (2011) used ARIMA model in forecasting inflation in the Bangladesh Economy. He showed that ARIMA (1, 0, 1) model fits the inflation data of Bangladesh satisfactorily. Al-Zeaud (2011) used ARIMA model in modeling &forecasting volatility. The result shows that best ARIMA models at 95% confidence interval for banks sector is ARIMA (2, 0, and 2) model. Uko et al. (2012) examined the relative predictive power of ARIMA, VAR & ECM models in forecasting inflation in Nigeria. The result shows that ARIMA is a good predictor of inflation in Nigeria & serves as a benchmark model in inflation forecasting.

From the above mentioned studies it is clear that ARIMA can be used to forecast. In very few of them the authors tried to find out best ARIMA model, but in most of the articles the authors used ARIMA to forecast. The present study is designed to select the best ARIMA model to forecast average daily price index of listed companies in Dhaka Stock Exchange.

III. Objectives of the Study

Share price index is a time series data. One of the important objectives of the time series analysis is to study the past behavior of the available data and then forecast with fitting a suitable model with the help of econometric or statistical techniques. Thus, the specific objectives of this study are as follows:

1. To check whether the selected time series data is stationary or not. If not, the data are to be transformed into stationary using suitable transformation.
2. To select the best ARIMA model using some selection criteria. Then ARIMA techniques are applied to fit and forecast the average daily share price indices of DSE data for the Square Pharmaceuticals Limited (SPL) Company.
3. Finally, to draw a conclusion for forecasting the average daily share price indices of the selected company efficiently.

IV. Data and Methodology

The ADSPI data recorded against SPL have been collected from Dhaka Stock Exchange (DSE) for the year 2011. Thus we obtained a total of 236 observations against all working days from Square Pharmaceuticals limited.

The stepwise methodology used in this study is outlined below:

Firstly, the data is presented graphically to check whether the data series is stationary or not. For this purpose, the statistics like Ljung-Box-Pierce Q-statistic (1978) based on auto correlation; Dickey-Fuller test (DF) (1979), Augmented Dickey-Fuller (ADF) test (1982) based on unit root process have been applied.

To select the best ARIMA (p, d, q) type of models fitted for the company, their goodness of fit have been compared using following criteria;

a) The Akaike Information Criteria (AIC)
b) The Corrected Akaike Information Criteria (AICc)
c) Schwartz Information Criteria (SIC)
d) Mean Absolute Percent Error (MAPE)
e) Root Mean Square Error (RMSE) and
f) Absolute Mean Error (AME)

A brief description about the criteria for the selection of best ARIMA model is given below:

a) Akaike Information Criterion (AIC)

AIC is an important and leading statistics by which we can determine the order of an autoregressive model Mr. Akaike developed this statistics. According to his name this statistics is known as Akaike Information Criterion (AIC). The AIC takes into account both how well the model fits the observed series and the number of parameters to be used in the fit. AIC due to Akaike (1969) is defined as

$$\mathbf{AIC} = \mathbf{N}\left(\mathbf{In}\hat{\delta}^{2} + 1\right) + 2(\mathbf{p}+1)$$

Where the parameter bears the usual meaning. Akaike also mention that the minimum AIC criterion produced a selected model, which is hopefully closer to the best possible choice.

b) Corrected Akaike Information Criterion

Sometimes the AIC does not provide the efficient order of model selection, which asymptotic efficiency is more desirable criterion. Shibata in 1976 shown that AIC criterion is not consistent too. Thus Hurvich and Tsai (1989) provide a criterion of AIC for bias. The correlation is of particular use when the sample size is small or when the number of fitted parameter is a moderate to a large fraction of sample size. The criterion is defined as

$$\mathbf{AIC}_{c} = \mathbf{N}\ln\hat{\delta}^{2} + \frac{1+\frac{\mathbf{P}}{\mathbf{N}}}{1-\frac{\mathbf{P}+2}{\mathbf{N}}}$$

i.e,

$$\mathbf{AIC}_{c} = \mathbf{AIC} + \frac{1+\frac{\mathbf{P}}{\mathbf{N}}}{1-\frac{\mathbf{P}+2}{\mathbf{N}}} = \frac{2(\mathbf{P}+1)(\mathbf{P}+2)}{(\mathbf{N}-\mathbf{P}+2)}$$

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Thus AIC_c is the sum of AIC and an additional non-stochastic penalty term 2(p+1) (p+2) / (N-p+2), where the parameter bears the usual meaning.

c) Schwaetz Information Criteria

In 1978 Schwaetz discussed a criterion denoted by SIC which help in deciding the order of auto regression. Initially he developed this criterion for taking decisions about the regress subset. Later Engel et. al, in 1992 use this criterion as a tool for determining the order of auto regression and they defined this criterion as below

$$\mathbf{SIC} = \hat{\delta}\left(-\frac{\mathbf{p}}{\mathbf{N}}\right)^{\frac{1}{2}} \mathbf{N}^{\frac{\mathbf{p}}{2\mathbf{N}}}$$

Where, the parameters bear the usual meaning. Schwartz also shows that this criterion is better than AIC. The model with minimum SIC assumes to describe the data series adequately. The minimum value of this criterion is desirable for the adequacy of a model.

Criteria used for testing the validity of model

The criteria mentioned above are compared for correct determination of the order of auto regression and the degree of differencing and this criterion is computed only for estimation period. But for the selection of an ARIMA model, which adequately describes the data series, the values of the following criteria are compared for three periods viz, estimation period, validation period and total period. The criteria used in this study are as follows:

a) Absolute Mean Error (AME)
b) Root Mean Square Error (RMSE)
c) Mean Absolute Percent Error (MAPE)

d) Absolute Mean Error (AME)

The mean of the absolute deviation of predicted and observed values is called absolute mean error and is defined as

$$\mathbf{AME} = \sum_{\mathbf{I=1}}^{\mathbf{T}} \frac{\left|\mathbf{Z_{obs}} - \mathbf{Z_{pred}}\right|}{\mathbf{T}}$$

This criterion is used for the comparison of the models in three periods.

e) Root Mean Square Error (RMSE)

The square root of the sum of square of the deviation of the predicted values from the observed value dividing by their number of observation is known as the root mean square error. The root mean square error is defined as

$$\mathbf{RMSE} = \sqrt{\frac{1}{\mathbf{T}}\sum_{\mathbf{I=1}}^{\mathbf{T}}\left(\mathbf{Z_{obs}} - \mathbf{Z_{pred}}\right)^2}$$

Where, T is the number of periods. This criterion is used for the comparison of the models in three periods.

f) Mean Absolute Percent Error (MAPE)

The mean of the sum of absolute deviation of predicted and observed value dividing by the observed value is called mean absolute error. For comparison we have multiplied by 100, which is called mean absolute percent error and which is defined as

$$\mathbf{MAPE} = \frac{1}{\mathbf{T}}\sum_{\mathbf{t=1}}^{\mathbf{T}} \frac{\left|\mathbf{Z_{obs}} - \mathbf{Z_{pred}}\right|}{\mathbf{Z_{obs}}} \times 100$$

Where, the parameters bear the usual meaning.

From the above discussion it is clear that the smaller error better the forecasting performance of the observed variables and if the model variable perform well, so will the model as a whole do too.

For the data series a separate ARIMA model has been used. For that purpose, a general concept of ARIMA (p, d, and q) model is discussed below:

ARIMA models are, in theory, the most general class of models for forecasting a time series that can be stationeries by transformations such as differencing and logging. If we have to difference a time series d times to make it stationary and then apply the ARMA (p, q) model to it, we can say that the original time series is ARIMA (p, d, q), that is it is an autoregressive integrated moving average time series, where p denotes the number of autoregressive terms, d denotes the time series have to be differenced before it becomes stationary and q denotes the number of moving average terms. Thus an ARIMA (2,1,2) time series has to be differenced once (d=1) before it becomes stationary and the stationary time series can be modeled as an ARMA (2,2) process that is it has two AR and two MA terms. Of course if d=0 then ARIMA (p, d=0,q) = ARMA (p, q). A most general ARIMA model constitutes three types of process named as autoregressive (AR) process, differencing to strip of the integration (I) and moving average (MA) process. The goodness of fit with respect to every criterion are examined and the model which satisfies most of the criterion, is considered as the best one.

Auto Regressive (AR) Process

In an autoregressive process each value in a series is linear function of the preceding value. Thus in the first order autoregressive process only the single preceding value is used as a function of current value. In the second order autoregressive process two preceding values are used as a function of the current value and so on. The first order autoregressive is denoted by AR (1), the second order autoregressive is denoted by AR (2) and up to the pth order autoregressive is denoted by AR (p).

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Let us suppose that the variable Y_t is a linear function of the preceding variable Y_{t-1}. Therefore the model can be written as

$$Y_t = \theta + \phi_1 Y_{t-1} + u_t \quad (1)$$

Where $u_t \sim IN(0, \sigma_u^2)$

The model (1) is known as AR (1) model.
But if we consider the model

$$Y_t = \theta + \phi_1 Y_{t-1} + \varphi_2 Y_{t-2} + u_t \quad (2)$$

Where $u_t \sim IN(0, \sigma_u^2)$

The model (2) is known as AR (2) model.
In general we can write

$$Y_t = \theta + \phi_1 Y_{t-1} + \varphi_2 Y_{t-2} + ... + \phi_p Y_{t-p} + u_t \quad (3)$$

Where ϕ_1 is known as the first order autoregressive coefficient, ϕ_2 is known as the second order autoregressive coefficient and so on
The model (3) is known as AR (p) model.

Differencing

Differencing is a comparatively simple operation that involves calculating consecutive changes in the values of the data series. Differencing is used when the mean of a series is changing over time to time. A consciousness that is homogeneously non-stationary can be transform into stationary by differencing. Differencing is not dealing with non-stationary variance. To difference a series once (d=1) we have to calculate the period to period change, to difference a series twice (d=2) we have to calculate the period to period changes in the first difference series and so on for further differences.

Moving Average

In Statistics, a moving average or rolling average is one of a family of similar techniques used to analyze time series data. It is applied in finance and especially in technical analysis. It can also be used as a generic smoothing operation, in which case the raw data need not be a time series.

A moving average series can be calculated for any time series. In finance it is most often applied to stock prices, returns or trading volumes. Moving averages are used to smooth out short-term fluctuations, thus highlighting longer-term trends or cycles. The threshold between short-term and long-term depends on the application, and the parameters of the moving average will be set accordingly.

Mathematically, each of these moving averages is an example of a convolution. These averages are also similar to the low-pass filters used in signal processing.

In moving average process, each value is determined by the average of the current disturbance and one or more previous disturbances. Suppose the model Y as follows:

$$Y_t = \theta + u_t + \beta_1 u_{t-1} \quad (4)$$

Where θ is constant and u is the white noise error term i.e., u~N$(0, \sigma^2)$. Here Y at time t is equal to a constant plus a moving average of the current and past error terms. In this case, we say that Y follows a first order moving average or MA (1) process.
But if Y follows the expression

$$Y_t = \theta + u_t + \beta_1 u_{t-1} + \beta_2 u_{t-2} \quad (5)$$

Then we say that Y follows a second order moving average or MA (2) process.
In general,

$$Y_t = \theta + u_t + \beta_1 u_{t-1} + \beta_2 u_{t-2} + ... + \beta_q u_{t-q} \quad (6)$$

Then we say that Y follows a qth order moving average or MA (q) process.

In short, a moving average process is simply a linear combination of white noise error terms.

Characteristics of a good ARIMA model

Our main motivation is to build up a good ARIMA model in this study. The Characteristics of a good ARIMA model are as follows:

1. A good model is stationary, that is, it has an AR coefficient that satisfies some mathematical inequalities.
2. A good model is invertible, that is, it has MA coefficient, which satisfies some mathematical inequalities.
3. A good model is parsimonious i.e., uses the small number of coefficients needed to explain the available data.
4. A good model has statistically independent residuals.
5. A good model has high-equality estimated coefficient at the estimation stage.
6. A good model fits the available data sufficiently well at the estimation stage.
7. Root-Mean Squared Error (RMSE) is acceptable.
8. Mean-Absolute percent error (MAPE) is acceptable.
9. A good model has sufficiently small forecast errors i.e., it forecasts the future satisfactory.

Selection of ARIMA models for ADSPI of SPL data series

In order to identify the tentative ARIMA model for the ADSPI of SPL, the steps described by Box and Jenkins have been followed. For this purpose the data

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are partitioned into two stages. The first stage is known as the estimation stage and second is known as the validation stage. The sample of observations 1 to 226 has been used in estimation stage and the rest has been used for testing the validity of model.

Ten ARIMA models with tentatively selected various values of p, d and q are estimated by using computer software SHAZAM versions 8.0 for windows. The ten tentatively selected models are ARIMA (1,1,1), ARIMA (1,1,2), ARIMA (2,1,1), ARIMA (2,1,2), ARIMA (1,1,3), ARIMA (2,1,3), ARIMA (3,1,1), ARIMA (3,1,2), ARIMA (3,1,3) and ARIMA (1,1,4). Among the models only five comparatively well performed models are displayed in the table -1c. Table- 1c discloses that ARIMA with p=2, d =1 and q=2 process has maximum number of lowest values of all the selected criteria AIC, AICc, SIC, and AME, RMSE, MAPE in the three periods i.e., estimation period, validation period and total period Hence, ARIMA (2,1,2) model has been selected for forecasting the ADSPI of SPL data series.

The fitted ARIMA (2, 1, and 2) model selected for SPL data series is given by

$$(1-0.6636*B-0.60032*B^2)\ SPL_{-t} = 0.0040125 + (1-0.44229*B-0.489*B^2)\ a_t$$
$$(0.2925)\quad (0.1737)\qquad\qquad (0.3036)\quad (0.1971)$$

(Values in the parenthesis are corresponding t-values and '*' means statistical significance p<0.01)

V. Results and Discussion

The major findings of the study are as follows:

1. The upward trends of plots of the data series are visualized although the overall trends are not smooth.
2. The ACF and PACF plots of original data series show that the Average Daily Share Price Indices (ADSPI) of Square Pharmaceuticals Limited (SPL) are non-stationary, that is, most of the ACF and PACF plots are beyond the confidence limits shown in Figure- 1a.
3. From ACF and PACF plots of logarithmic transformation data series has been found that the ADSPI of SPL data series is still non-stationary, that is, all the ACF & PACF plots are out of the confidence limits.Shown in figure-1b. But after taking first difference of logarithmic values of SPL data series, the same plots shows that the data is stationary shown in Figure- 1c.
4. The Dickey-Fuller unit root test statistic and the Ljung-Box-pierce Q-Statistic also indicate that the Average Daily Share Price Indices (ADSPI) of SPL data series is non-stationary. The computed absolute values of the τ-statistic for SPL is found as $|\tau| = 1.7133$, none of which exceeds the DF or Mackinnon DF absolute critical τ values (to be noted that 1%, 5% and 10% level of significance the absolute DF values are 4.047, 3.462 & 3.13 respectively) shown in Table- 1a.
5. After taking first difference of logarithmic values of SPL data series, the same test statistic shows that the data is stationary, because hence the computed absolute value of the τ-statistic is $|\tau| = 4.2651$ which exceeds the DF or Mackinnon DF absolute critical τ values shown in Table- 1b.
6. For SPL data series ten types of tentatively ARIMA models with varied values of p, d & q are selected of which five-performed model for the data series are estimated and the validity of the model is tested by using AME, RMSE & MAPE for three different period shown in Tabil -1c.
7. It is found that ARIMA (2, 1, 2) is the best model for forecasting the SPL data series.
8. Finally, the Average Daily Share Price Indices (ADSPI) for Square Pharmaceuticals Limited (SPL) data series have been forecasted by using the selected model and reported in table- 1d.

Table 1(a) : The values of the various stationary tests of the company for average daily share price indices of DSE data series

Test Statistic		SPL
Ljung-Box-Pierce Q-statistic	Time lag-10	1947.02
	Time lag-20	2999.72
Dickey-Fuller test		-1.7133

At 1%, 5% and 10% level of significance the DF values are –4.047, -3.462 and –3.13 respectively.

Table 1(b) : Values of Dickey-Fuller test statistic for different values of differencing of Logarithmic Transformation SPL data series

Difference	SPL
0	-1.6605
1	-4.2651
2	-10.027

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VI. Conclusion

This study made the best endeavor to develop the best ARIMA model to efficiently forecasting the Average Daily Share Price Indices (ADSPI) of the Square Pharmaceuticals Limited (SPL), because if it is possible to provide a better model for the share market which can enable the investors to predict the prices in advance, it would help the investors as well as stability of the national economy. The empirical analysis indicated that the ARIMA (2,1,2) model is best for forecasting the Average Daily Share Price Indices (ADSPI) of the Square Pharmaceuticals Limited (SPL) data series so far the diagnostic criteria are concerned. Finally, the Average Daily Share Price Indies (ADSPI) for Square Pharmaceuticals Limited (SPL) data series is forecasted up to February, 2012 by using the selected model.

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Appendix

Figure 1 (a) : The ACF and PACF plots of original data for average daily share price indices of SPL data series

```
                                                      0     0 0
AUTOCORRELATION FUNCTION OF THE SERIES          (1-B) (1-B) AVG

 1 0.98 .                              +   RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR.
 2 0.96 .                            +     RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR.
 3 0.95 .                           +      RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR .
 4 0.93 .                          +       RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR .
 5 0.91 .                         +        RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR  .
 6 0.89 .                        +         RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR  .
 7 0.87 .                       +          RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR  .
 8 0.84 .                      +           RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR  .
 9 0.81 .                     +            RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR   .
10 0.78 .                    +             RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR   .
11 0.75 .                    +             RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR   .
12 0.73 .                   +              RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR   .
13 0.70 .                   +              RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR   .
14 0.67 .                  +               RRRRRRRRRRRRRRRRRRRRRRRRRRRRRR    .
15 0.65 .                  +               RRRRRRRRRRRRRRRRRRRRRRRRRRRRRR    .
16 0.62 .                 +                RRRRRRRRRRRRRRRRRRRRRRRRRRRRR     .
17 0.60 .                 +                RRRRRRRRRRRRRRRRRRRRRRRRRRRRR+    .
18 0.58 .                 +                RRRRRRRRRRRRRRRRRRRRRRRRRRRRR+    .
19 0.56 .                +                 RRRRRRRRRRRRRRRRRRRRRRRRRRR  +    .
20 0.54 .                +                 RRRRRRRRRRRRRRRRRRRRRRRRRR   +    .
21 0.52 .                +                 RRRRRRRRRRRRRRRRRRRRRRRRRR   +    .
22 0.50 .               +                  RRRRRRRRRRRRRRRRRRRRRRRRR     +   .
23 0.49 .               +                  RRRRRRRRRRRRRRRRRRRRRRRRR     +   .
24 0.48 .               +                  RRRRRRRRRRRRRRRRRRRRRRRRR     +   .

                                                            0     0 0

PARTIAL AUTOCORRELATION FUNCTION OF THE SERIES   (1-B)(1-B) AVG

  1 0.98 .                                +   RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR.
  2 0.13 .                                +   RRRRRR                            .
  3 0.02 .                                +   RR  +                             .
  4 -.13 .                               RRRRR   +                              .
  5 -.02 .                                +  RR   +                             .
  6 -.06 .                                + RRR   +                             .
  7 -.12 .                               RRRRR   +                              .
  8 -.13 .                               RRRRR   +                              .
  9 -.01 .                                +   R   +                             .
 10 -.10 .                               RRRRR   +                              .
 11 0.08 .                                +   RRRR+                             .
 12 0.09 .                                +   RRRR+                             .
```


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Figure 1 (b) : The ACF and PACF plots of Logarithmic Transformation data for average daily share price indices of SPL data series

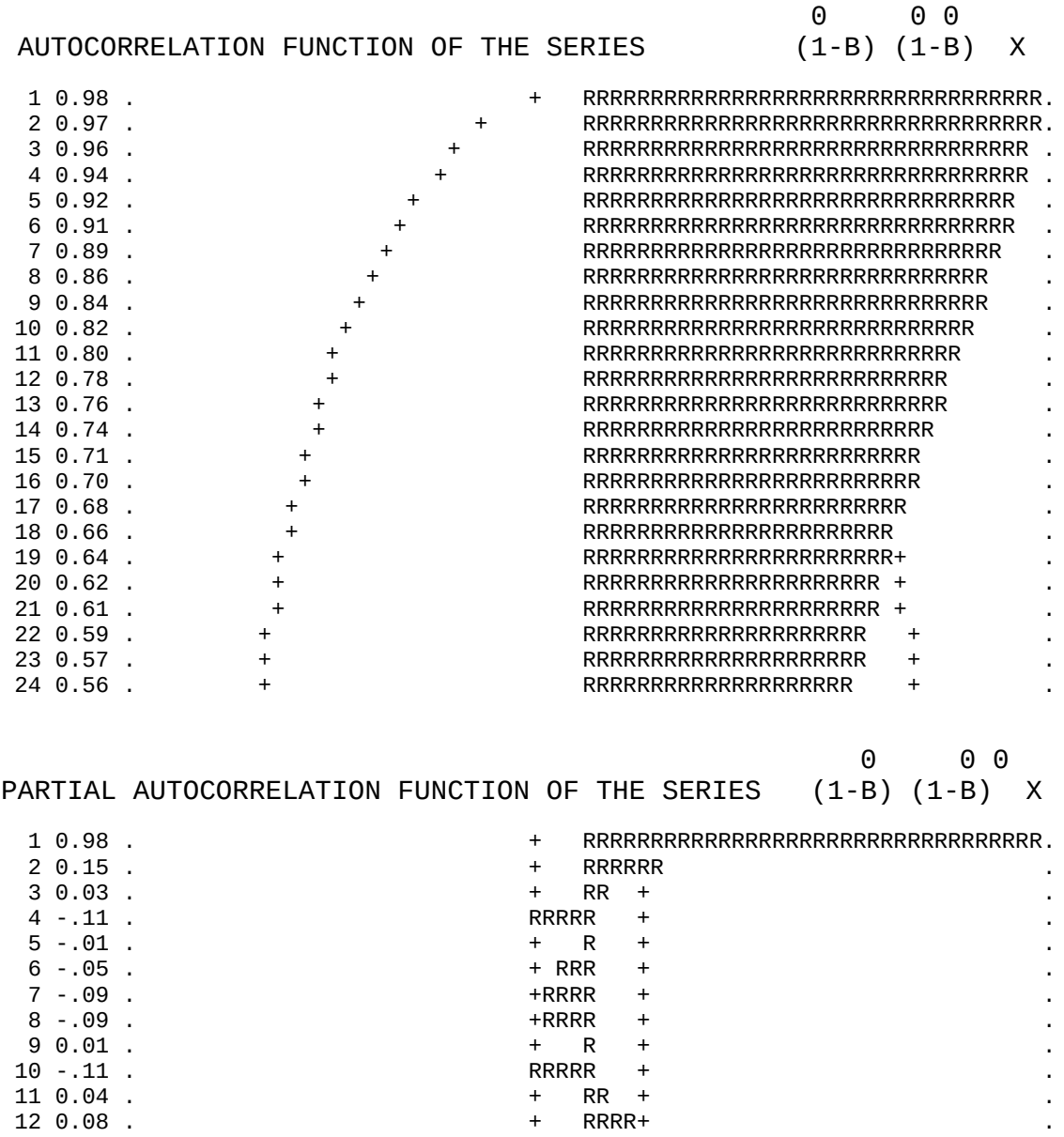

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Figure 1 (c) : The ACF and PACF plots of Logarithmic Transformation data for average daily share price indices of SPL data series with difference one

```
                                                    1     0 0
AUTOCORRELATION FUNCTION OF THE SERIES           (1-B) (1-B)  X

 1 -.23 .                          RRRRRRRRR   +                    .
 2 0.00 .                             +    R    +                   .
 3 0.13 .                             +    RRRRR+                   .
 4 -.03 .                             +   RR    +                   .
 5 0.06 .                             +    RRR  +                   .
 6 0.09 .                             +    RRRR +                   .
 7 0.09 .                             +    RRRR +                   .
 8 -.05 .                             +  RRR    +                   .
 9 0.14 .                             +  RRRRRR +                   .
10 -.08 .                             + RRRR    +                   .
11 -.03 .                             +   RR    +                   .
12 0.04 .                             +    RR   +                   .
13 0.06 .                             +    RRR  +                   .
14 -.03 .                             +   RR    +                   .
15 -.11 .                             +RRRRR    +                   .
16 0.11 .                             +    RRRRR+                   .
17 -.10 .                             + RRRR    +                   .
18 -.03 .                             +   RR    +                   .
19 -.02 .                             +   RR    +                   .
20 -.04 .                             +   RR    +                   .
21 0.10 .                             +    RRRR +                   .
22 -.19 .                            RRRRRRR    +                   .
23 -.05 .                             +  RRR    +                   .
24 0.09 .                             +    RRRR +                   .

                                                    1     0 0
PARTIAL AUTOCORRELATION FUNCTION OF THE SERIES   (1-B) (1-B)  X

 1 -.23 .                          RRRRRRRRR   +                    .
 2 -.05 .                             + RRR    +                   .
 3 0.12 .                             + RRRRR  +                   .
 4 0.03 .                             +   RR   +                   .
 5 0.07 .                             +   RRRR+                    .
 6 0.11 .                             +   RRRRR                    .
 7 0.15 .                             + RRRRRR+                    .
 8 -.01 .                             +   R    +                   .
 9 0.12 .                             +   RRRRR                    .
10 -.06 .                             + RRR    +                   .
11 -.08 .                             +RRRR    +                   .
12 -.06 .                             + RRR    +                   .
```

Table 1 (c) : The values of diagnostic criteria for ARIMA model for logarithmic transformation difference series of average daily share price indices of DSE data of Square Pharmaceuticals limited

Transformation Difference=1

Criteria	Period	Validation of diagnostic criteria for the model				
		ARIMA (1,1,1)	ARIMA (1,1,2)	ARIMA (1,1,3)	ARIMA (2,1,1)	ARIMA (2,1,2)
AIC	Estimation	-6.4781	-6.5012*	-6.4729	-6.4797	-6.4679
AICc	Estimation	-6.4275	-6.4506*	-6.4223	-6.3780	-6.3662
SIC	Estimation	-6.4339	-6.4423*	-6.3993	-6.4208	-6.3943
AME	Estimation	0.00098364	0.0010903	0.00096091	0.00093692	0.0008849*
	Validation	0.00096132*	0.0011192	0.0010414	0.0014722	0.0024209
	Total	0.00060532	0.0006709	0.00059133	0.00057657	0.0005446*

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RMSE	Estimation	0.0039346	0.0043614	0.0032933*	0.0037477	0.0035398
	Validation	0.0030400*	0.0035393	0.0038436	0.0046554	0.0076556
	Total	0.0030865	0.0034213	0.0030152	0.0029399	0.0027768*
MAPE	Estimation	0.000028956	0.00003209	0.000028287	0.00002758	0.0000260*
	Validation	0.00002981*	0.00003470	0.000032293	0.00004565	0.0000751
	Total	0.000017819	0.00001995	0.000017407	0.00001697	0.0000160*
No. Of lowest values		03	03	01	0	05

Note: A '*' (starlet) indicate the lowest value in each row.

Table 1 (d) : The observed and forecasted values with its lowest and highest values obtained by ARIMA (2,1,2) model for ADSPI of SPL data series

Future Date	Lower	Forecast	Upper	Actual	Error
220	8.04513	8.11908	8.19303	8.11731	-0.176589E-02
221	8.03266	8.12080	8.20894	8.08148	-0.393235E-01
222	8.02160	8.12278	8.22396	8.06621	-0.565736E-01
223	8.01207	8.12475	8.23742	8.08148	-0.432712E-01
224	8.00361	8.12671	8.24981	8.09132	-0.353913E-01
225	7.99597	8.12868	8.26139	8.07683	-0.518527E-01
226	7.98898	8.13064	8.27231	8.16990	0.392577E-01
227	7.98252	8.13261	8.28271	8.07869	-0.539229E-01
228	7.97650	8.13458	8.29265	8.08487	-0.497067E-01
229	7.97088	8.13654	8.30221	8.08364	-0.529064E-01
230	7.96558	8.13851	8.31144	8.09040	-0.481075E-01
231	7.96058	8.14048	8.32037	8.07652	-0.639606E-01
232	7.95584	8.14244	8.32904	8.07714	-0.653055E-01
233	7.95133	8.14441	8.33749	8.15306	0.865358E-02
234	7.94703	8.14637	8.34572	8.08425	-0.621205E-01
235	7.94292	8.14834	8.35376	8.19395	0.456122E-01
236	7.93899	8.15031	8.36162	8.12356	-0.267491E-01
237	7.93522	8.15227	8.36933		
238	7.93159	8.15424	8.37688		
239	7.92811	8.15621	8.38430		
240	7.92475	8.15817	8.39160		
241	7.92150	8.16014	8.39877		
242	7.91837	8.16210	8.40583		
243	7.91535	8.16407	8.41279		
244	7.91242	8.16604	8.41965		
245	7.90959	8.16800	8.42642		
246	7.90684	8.16997	8.43310		
247	7.90417	8.17194	8.43970		
248	7.90159	8.17390	8.44622		
249	7.89908	8.17587	8.45266		
250	7.89664	8.17783	8.45903		
251	7.89427	8.17980	8.46533		
252	7.89196	8.18177	8.47157		
253	7.88971	8.18373	8.47775		
254	7.88753	8.18570	8.48387		
255	7.88540	8.18766	8.48993		
256	7.88333	8.18963	8.49593		
257	7.88131	8.19160	8.50189		
258	7.87934	8.19356	8.50779		
259	7.87741	8.19553	8.51364		
260	7.87554	8.19750	8.51945		
261	7.87371	8.19946	8.52521		
262	7.87193	8.20143	8.53093		
263	7.87018	8.20339	8.53661		
264	7.86848	8.20536	8.54224		
265	7.86682	8.20733	8.54784		
266	7.86519	8.20929	8.55339		

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267	7.86360	8.21126	8.55891		
268	7.86205	8.21323	8.56440		
269	7.86054	8.21519	8.56985		

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Investment Attitude of Women towards Different Sources of Securities - A Factor Analysis Approach

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Abstract - The study aims to gain knowledge about the marital status and age factors influencing the investment behaviour of women towards financial instruments with special reference to Erode district. Through the existing literature can be known that there are certain age and marital differences occurs in the behaviour of selecting the investment sources .younger and unmarried are usually risk takers. Older and married are avoiding taking risk. So the descriptive study is carried out to identify about these factors which are influencing the investment decision. Convenient sampling techniques are used to identify the respondents and it is limited to Erode District. The study will be helpful to the government or non-governmental organizations to launch various saving schemes based on the age and marital status to the women to ensure their saving habits so as to promote economic development of the country.

Keywords : *investment behaviour, marital status and age factors, financial instruments, women investment behaviour, saving habits, economical development.*

GJMBR-C Classification : *JEL Code: F21*



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Investment Attitude of Women towards Different Sources of Securities - A Factor Analysis Approach

Dr. R. Sellappan [α], Ms. S. Jamuna [σ] & Ms. Tnr. Kavitha [σ]

Abstract - The study aims to gain knowledge about the marital status and age factors influencing the investment behaviour of women towards financial instruments with special reference to Erode district. Through the existing literature can be known that there are certain age and marital differences occurs in the behaviour of selecting the investment sources .younger and unmarried are usually risk takers. Older and married are avoiding taking risk. So the descriptive study is carried out to identify about these factors which are influencing the investment decision. Convenient sampling techniques are used to identify the respondents and it is limited to Erode District. The study will be helpful to the government or non-governmental organizations to launch various saving schemes based on the age and marital status to the women to ensure their saving habits so as to promote economic development of the country.

Keywords : investment behaviour, marital status and age factors, financial instruments, women investment behaviour, saving habits, economical development.

I. Introduction

Women constitute above half of the world population. Their contribution is about 55% including their unpaid economic activities. Hence there is every reason that women should plan an equal role in economic decision making. The 1994 world survey on the role of women in development reported that the ratio of women to men is economically active population has almost doubled over the last 20 years. With the increase in role of women in the economic activities and by nature, women are being identified as a better saver than man, the decision making process by women for investment purpose gains its importance.

Traditionally, women have generally been more hesitant when it comes to financial investments. They are more cautious when it comes to money. The new women investment clubs take the fear out of investing for women. The hand that rocks the cradle rules the world is popular saying about women. Saving is a habit specially embodied to women. Even in the past, when mainly depended on their spouse's income, they used to save to meet emergencies as well as for future activities. In those days, women did not have any awareness about various investment outlets. But as time passed, the scenario had totally changed.

Now, the present women, who is equally employed, through their education have knowledge about various aspects of investment and as a result they invest in various investment avenues such as shares, debentures, mutual funds, commodities and bank deposits.

Indian savings market has been expanding over the period and there is a steady increase of household savings. Moreover, general profile of women investors is changing in tune with time. But they lag in various spheres of investment such as awareness and preference of investment. So, an attempt has been made by the researcher to identify the factors influencing women investor's behavior to evaluate the level of awareness among women investors and to analyze the preference of women investor towards various investment outlets.

Employed women have a greater propensity to save and invest because of their independent earning power. They are also motivated by the investment behavior of their colleagues in their work place. They are supposed to be risk adverse, safety oriented and guided by certainty of returns. With increasing level of knowledge and awareness, Women are slowly participating in the risk investment portfolios and they are becoming analytic in their investment behavior.

Women in India now participate in all activities such as education, politics, media, science and technology, etc. With a changing scenario, women has started actively participating in investing their surplus money, though it all depends upon the various parameters such as degree of their risk taking capability, influence of family members and friends and the dare to get exposed to modern and innovative investment avenues. The present research study is focused on the working women's attitude towards investment and the marital status and age factors responsible for investment behavior of women. While investing, the family related matters such as child education, child marriage, life protection and medical expenses have a much more impact on the minds of married working women than on unmarried ones.

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Previous Study has revealed that female powerlessness in much more acute in north India than in south. Women in the north have relatively little autonomy or freedom of movement, limited inherit ants rights in practice , limited support from their family and limited opportunities for control over economic resources. In contrast women in south India have closer natal ties, greater decision making authority and control over the resources.

In fact, in small and middle class families it is the woman who practically saves for the family. Women by nature are gold loving. They save their money in the form of different gold ornaments which is highly liquid financial investment.

II. Need of the Study

Investment behaviours are differing from individual to individual based on the acceptance of return and risk. As well as the selection of investment sources also differ from men and women. Because men tend not to want too much detail while women want more information. And men and women differ in their approach to the investment game. And the difference is quite marked during the initial process.

A poll conducted in the U.S. in the late 1990s found that women spend 40% more time researching a mutual fund before they invest. What's more, they tend to be less impulsive and less inclined to act on a hot tip than men are. It also found women to be less confident in their investing abilities than men. Only 56% of women feel confident about their investing abilities versus 64% of men.

Men are risk-takers; women want to play it safe. According to Ayse Yuce, professor of finance the female students working together seemed to choose the more conservative portfolios and seemed to make the most money," says Yuce. "The male pairs of students seemed to choose more aggressive and riskier investments and while some did well, many did not. With the mixed pairs, the female students often deferred to the male students and let them make the decision. If they lost money, the females said it was the men's fault because they wanted to choose riskier investments."

This is a general fact that Men are usually think about return .but the women want to balance with risk and return in their investment. In most of the cases the women want to earn stable income. While framing investment portfolio women are considered about safety, liquidity, and profitably but men are mostly think about profitability alone. In this manner the investment behavior is varied from men and women.

So the descriptive research is decided to find out the factors which are influencing the investment behaviors working women. The study will be conducted in Erode District among the working women because they have enough knowledge about the investment and this study will give certain guidance to select best investment among alternatives. Also this study will useful to the various financial sectors to frame the policies for women based on their requirement. So as to the saving habits of women will be raised which ensure economical development of the country.

III. Review of Literature

1. Karthikeyan(2001) has conducted a research on small investors perception on post office saving schemes and found that there was significant difference among the four age groups ,in the level of awareness for Kissan Vikas Pathra (KVP), National saving schemes (NSC) and Deposit Scheme for Retired Employees (DSRE) the overall score confirmed that the level of awareness among investors in the old age group was higher than in those of young age group.
2. National Council of applied economic research (NCEA) (1961) "Urban saving survey" noticed that irrespective of occupation followed and education level and age attained, households in each group thought of saving for the future was desirable. It was found that desire to make provision for emergencies were a very important motive for saving for old age.
3. Warren *et al.* (1990) and Rajarajan (2000) predict individual investment choices (e.g., stocks, bonds, real estate) based on lifestyle and demographic attributes. These investors see rewards as contingent upon their own behaviour.
4. Quantitative and qualitative research carried out in the UK indicates that attitudes to investment risk depend on factors such as personality, circumstances, educational attainment, level of financial knowledge and experience, and extent of financial product portfolio (Conquest Research Limited, 2004; Distribution Technology, 2005). Quantitative research carried out in the US identifies a similar range of factors, including income, wealth, age, marital status, gender and level of education (Finke and Huston, 2003).
5. Attitudes to risk change over time as needs alter and people's capacity to afford to lose varies (Conquest Research Limited, 2004). The evidence indicates fairly clearly that willingness to take financial risk decreases significantly among people who are retired or nearing retirement (Distribution Technology, 2005; Finke and Huston, 2003). In addition, work carried out in the UK on the measurement of investors' risk appetite (which depends on their attitude to risk) suggests that it fluctuates within a relatively narrow gauge during 'normal' times, but falls sharply during crises (Gai and Vause, 2005).

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6. Clark and Strauss, (2008) it has been observed that women are more risk averse than men, the young are more risk seeking than the old, wealthier individuals manifest a greater willingness to invest in equities and the poor are risk averse securities.

IV. Statement of the Problem

The present study aims to put on some knowledge about key factors that influence investment behavior and ways these factors impact investment risk tolerance and decision making process among women and different age groups in relation with marital status. The individuals may be equal in all aspects, but their behavior is different in same situation. Earlier studies did research but they did this only gender wise, in this study we are trying to find out the factors which affects individual investment decisions by considering both age and marital status wise. Hence keeping this in mind, the present study is an attempt to find out Factors which affects individual investment decision and Differences in the perception of Investors in the decision of investing on basis of Age and on the basis of marital status.

V. Objective of the Study

To know the impact of marital status and age factors in the investment attitude of women while selecting the securities to invest.

VI. Database and Research Methodology

Descriptive research study is used to carry out the research with convenient sampling technique. Primary data is collected from the population through scheduled interview.

VII. Data Analysis

The two factors viz age and marital status which are influencing the women investor while selecting the securities to invest. H1 is the alternative hypothesis specify the relationship between the factors viz., age and marital status in investing behaviour of women and H0 is the null hypothesis specifies the is no relationship between the factors age and marital status in investment behaviour.

Table 1 : Two Way Tables Showing the Classification of Respondent Based on Age Group and the different investment sources

Age	Fixed deposit	Insurance	Mutual fund	Stock	Real estate	Commodity	Others
20-30	29(26.41)	34(38.56)	17(13.73)	13(9.51)	8(12.68)	1(0.53)	1(1.58)
31-40	8(11.28)	17(16.47)	3(5.87)	4(4.06)	12(5.42)	0(0.22)	0(0.68)
41-50	9(9.49)	15(13.85)	6(4.93)	1(3.41)	4(4.55)	0(0.19)	2(0.57)
Above 50	4(2.82)	7(3.12)	0(1.47)	0(1.02)	0(1.35)	0(0.06)	0(0.17)
Total	**50**	**73**	**26**	**18**	**24**	**1**	**3**

a) Hypothesis

H0 = There is no relationship between Age and Investment Avenue.

H1 = There is relationship between Age and Investment Avenue.

Degree of freedom = (Column – 1) X (Row – 1) = (7-1) X (4-1) = 6 X 3 = 18, Critical value for Chi-square distribution 18" = 28.87, Calculated value = 28.95029, so, calculated value is greater than the table value (28.95029 > 28.87).

Hence, the calculated value 28.95029i s lower than the table value 28.87.So H0 is rejected which specifies there is no relationship between age and investment avenue this may be due to degree of awareness regarding investment and risk averse.

Table 2 : Two Way Tables Showing the Classification of Respondent Based on Marital status and the different investment sources

Martial status	0-10%	11%-20%	21%-30%	31%-50%	Total
Married	38(33.3)	27(27.13)	7(12.33)	2(1.23)	74
Unmarried	16(20.7)	17(16.87)	13(7.67)	0(.77)	46
Total	54	44	20	2	120

b) Hypothesis

H0 = There is no relationship between Marital and Investment Avenue.

H1 = There is relationship between Marital and Investment Avenue.

i. *Interpretation*

The above analysis resulted that the calculated value is greater than the table value (28.95.29 > 28.87). Reject the H0. Hence, there is a relationship between the marital status and investment Avenues may be due

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to awareness and interests in savings. Because married women are not willing to invest in high risky securities.

VIII. Conclusion

From the above study can be concluding that married women are more curious in making investment than the unmarried. As well as the younger are mostly like to invest in shares mutual funds, insurance and fixed deposits than the older women. The middle age persons prefer to invest in real estate source of investment. So the government, Bankers and Financial institutions can introduce lot of schemes of investment based on segmentation of the age and marital status factors to acquire more funds.

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Financial Development and Capital Flows: The Effect on the Real Exchange Rate

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Abstract - The object of this paper is to determine the role played by the financial development in the effect of capital flows on real effective exchange rates. Our object is based on the idea that a developed financial market allows a better allocation of resources. Using the methodology of dynamic panel co-integration for 38 developed and developing countries covering the period 1989-2011, the results show that in the long run the development of the financial sector can weaken the appreciation effect of capital flows on real effective exchange rates. Through the calculation of the threshold value, we can conclude that from a certain threshold of the indicators of financial development the capital flows can have a real depreciation effect on exchange rates.

Keywords : *financial development, capital flows, real exchange effective rates, panel co-integration, non-stationary heterogeneous panels, pooled meam-group estimator.*

GJMBR-C Classification : *JEL Code: D51, FOR Code: 910104*



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Financial Development and Capital Flows: The Effect on the Real Exchange Rate

Ali Lamouchi [α] & Ezzeddine Zouari [σ]

Abstract - The object of this paper is to determine the role played by the financial development in the effect of capital flows on real effective exchange rates. Our object is based on the idea that a developed financial market allows a better allocation of resources. Using the methodology of dynamic panel co-integration for 38 developed and developing countries covering the period 1989-2011, the results show that in the long run the development of the financial sector can weaken the appreciation effect of capital flows on real effective exchange rates. Through the calculation of the threshold value, we can conclude that from a certain threshold of the indicators of financial development the capital flows can have a real depreciation effect on exchange rates.

Keywords : financial development, capital flows, real exchange effective rates, panel co-integration, non-stationary heterogeneous panels, pooled meam-group estimator.

I. Introduction

Since the Eighties, the flows of capital, in particular in emerging economies, were characterized by more or less high volatility. From 2003, net capital flows to emerging countries increased considerably. The increase in the volume of capital flows showed that the beneficiary countries are unable to manage perfectly this capital. This bad management and allocation of capital flows tend to favor the saving with regard to the investment. The increase in level of saving made reveals that capital flows can be a source of macroeconomic instability and, at the same time it defied the conventional sight that capital flows are always advantageous in terms of the increase in financial resources leading to a greater volume of investment (Mohan and Kapur, 2010). This macroeconomic instability caused by the excessive mobility of the capital, can be expressed by accelerated rates of growth and inflation and in particular by an appreciation of the real effective exchange rate (Combes, Kinda and Plane, 2011). Indeed, the experience of a certain number of countries proved that a real appreciation of exchange rate due to capital flows cannot only discourage the investment, but it can also destabilize macroeconomic management severely, according to Corden (1994). In particular, a broad real appreciation of country's national currency, following an excessive flow of the capital, degrades the competitiveness of the exposed sector and leads to a deterioration of the current account and an increasing vulnerability to the crisis (Reinhart and Rogoff, 2008).

With an aim to protect their economies from the massive volatility of capital flows, and from their repercussions on the rate of real exchange, the careful macroeconomic strategies as the intervention sterilized on the exchange market, the control of capital account and the tight fiscal policy were applied by the majority of countries, in particular the emerging countries. With the exception of some cases, the adoption of these strategies did not contribute the countries to weaken the effects of appreciation of capital flows on real exchange rate (Reinhart and Khan, 1995). The question which arises: are they other policies allowing including the effects of capital flows on real exchange rate?

In our work, we will emphasize the role of financial market development in the relation between the real exchange rate and capital flows. The choice of financial development strategy is explained by the fact that a developed and active financial market allows a better allocation of resources. Indeed, a developed financial sector has a capacity to provide information with moderate cost about the investment opportunities and to create additional incitements to study extensively their potential. Additional information improves the effective distribution of resources and makes it possible to improve the investment. Moreover, the volume of investments, offered in the well-developed financial markets, allows not only to economy to employ its resources effectively but also it is a significant factor in the mobilization of the saving as well as the facilitation of the diversification of risk (Saborowski, 2009).

Considering the importance of a developed financial market in the implementation of a better allocation of external resources (capital flows), it remains to determine with precision the nature of the impact of financial development on the relation between the real exchange rate and capital flows. By supplying a wide range of interesting investments, and by managing the capital flows towards an using more productive, many effective financial markets and institutions can reduce the probability that capital flows are directed towards sectors of which the demand increases without improving the produce's capacity of the economy.

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Leading capital flows towards productive sectors, an increase in demand of domestic consumption will take place and it can be a deciding factor in the relationship between the relative prices of exchangeable and non-exchangeable goods (this ratio which definite real exchange rate). Through the using the co-integration techniques for non-stationary heterogeneous panel data for 38 developed and developing countries covering the period 1989-2011, the object of our work is to determine the role of financial market development in the long-term relationship between the real exchange rate and financial development.

To answer this question, we should divide our work in three sections. In the first section, an outline of main theoretical and empirical works, which examined the theme of financial development, capital flows and real exchange rate, is presented. The second section is devoted to the definition of variables as well as empirical methodology. Finally, the specification of the model and the presentation of results of estimates and pulled conclusions will be the objects of the third section.

II. Related Literature

Capital flows and their effects on the macroeconomic aggregates (particular on growth and of real exchange rates) were the objects of a significant number of theoretical and empirical works (Ghosh, Goretti, Joshi, Ramakrishnan, Thomas and Zalduendo, 2008; Baqir, Duttagupta, Stuart and Tolosa, 2010 and Berg, Mirzoev, Portillo, Zanna, 2010). If capital flows represent a fundamental factor for the development of an economy by increasing the indicator of economic growth, this will not prevent that they have negative side effects, particularly on the value of national currency, by generating an increase in the relative price ratio of exchangeable and non-exchangeable goods and by consequence an appreciation of real exchange rate.

The passion for opening of the capital account, in particular, by developing countries is explained by the significant effects of capital flows on economic growth Gruben and McLeod, 1998; Bosworth and Collins, 1999 and Gheeraert and Mansour, 2005). The partisans of financial liberalization regard the positive effect of capital flows on growth as a crucial advantage of financial integration for the developing countries (Mody and Murshid, 2005 and Mileva, 2008). With the exception of some studies which found ambiguities in the determination of capital flows impact on economic growth, the majority of empirical works showed the existence of positive relations between foreign direct investments (used like an indicator of capital flows) and economic growth. Via the adopting different proxies of capital flows, Bailliu (2000) emphasized, on one hand, the role of private capital movements in the increase of the level of economic growth for 40 developing countries covering the period 1975-1995 and on the other hand, the role played by domestic financial sector development in the definition of the relation between capital flows and economic growth. Using the methodology of dynamic panel data, the results reached show that the positive effects of capital flows (increase of the economic growth) on growth are higher than those on interest rate of credit (consequently, on the level of investment). But this result is valid only for the economies whose financial sector affected a certain degree of development. Bailliu concludes that the positive function which links international capital mobility and economic growth depends considerably on the degree of domestic financial sector development.

The effects of capital flows on real exchange rate depend generally on macroeconomic and financial policies applied by economics beneficiaries of this capital, namely capital account openness, exchange system, prudential measures to control capital and financial development (Mohan and Kapur, 2010).

In certain cases, the appreciation effect sudden of real exchange rate encouraged the countries to adopt prudential measures to limit the degradation of their competitive capacities, in particular the intervention sterilized on exchange market, the control of capital count and the application of a more severe fiscal policy. With exception of some countries, these prudential measures haven't generally succeeded in providing better results in particular when capital inflow is persistent (Kose, Elekdag and Cardarelli, 2009).

Improving the effectiveness of the allocation of resources, Saborowski (2009) shows that the development of the financial sector could weaken the appreciation effect of capital flows. Using the method of GMM-IV to models with dynamic panels for a sample of 84 developed and developing countries covering the period 1990-2006, the results prove that the appreciation of real exchange rate due to the effect of FDI inflows is attenuated when financial and capital markets are more developed and active. One of the implications of these results is that among the dangers' effects related to massive capital flows in emerging economies (macroeconomic instability due to a significant appreciation of real exchange rate) can be moderate partly by developing financial sector depth. In a similar vein, Otker-Robe, Polanski, Topf and Vavra (2007) suggested that, by emphasizing the experiences of developed and developing European countries over the period 1994-2005, the development of a deep and active financial sector can be used to weaken the process linking capital flows and appreciation of real exchange rate.

Making a comparative study, Athukorala and Rajapatirana (2003) showed that the appreciation effect of real exchange rate due to capital flows was stronger in the emerging countries of Latin America than in Asian countries for the period 1985-2000. The explanation of

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the authors was that financial markets in Latin America are more developed compared to those of Asian countries. De la Torre, Gozzi and Schmukler (2007) also confirmed this explanation. Emphasizing the relation between private transfers (in particular, the remittances), financial development and the real exchange rate, Acosta, Baerg and Mandelman (2009) tried to examine the role of financial development in moderation of real exchange rate appreciation caused by private capital flows. The application GMM-IV method for a dynamic panel of 109 developing and transition countries during the period 1990-2003, the results prove that well-developed financial sector is susceptible more effectively to benefit of private transfers as opportunity investment. Also, the authors suggest that private transfers tend to carry out increasing pressures of appreciation on real exchange rate. But this effect will be weaker in the case that country having deeper and more sophisticated financial markets which are able to maintain the competitiveness commercial of economies.

Also, Aghion, Bacchetta and Rogoff (2009) showed the significant role of financial development in the determination of the impact of real exchange rate volatility on the growth rate of productivity.

Others that financial development, some studies tried to examine the role of other policies (control of capital account, financial openness and exchange rate system) in the definition of the relation linking real exchange rate and capital flows. In general, the control of capital tends to reduce the external loans, but it does not have any impact on the total volume of capital flow, except for the IDE. What explains the absence of empirical evidence showing that restrictions on the mobility of capital help to moderate the appreciation of the exchange rate and that they increase the degree of independence of monetary policy. On the contrary, controls of capital can significantly increase the volatility of the exchange rate (Clements and Kamil, 2009). Concerning the financial openness, which is generally associated with a high rate of economic growth, Bekaert, Harvey, Lundblad and Siegel (2010) proved that the effect of financial openness on productivity growth is a permanent effect and that it is more significant than an effect on growth of capital.

According to the authors, these permanent effects are due to the role played by financial openness in the development of the banking sector and stock market and also in the improvement of financial institution's quality. The results show that there is no very evidence for a higher effectiveness of investment after financial liberalization. Using threshold analyses, the authors show that the responses of productivity growth to a liberalization of capital account are significant for countries with a financial developed sector. Another conclusion, determined by Bekaert, Harvey, Lundblad and Siegel, is that the increase in volume of growth caused by financial openness is higher than the reduction in volume of growth caused by the regional and global banking crises. In a more recent study, Huang (2011) has shown that country which wants to open largely its financial market to realize a higher growth and to decrease the financial instability (which represents an inevitable cost of such policy), must reinforce considerably its financial systems to prevent any reason of financial vulnerability.

The results of studies presented above show the importance of some economic policies in the definition of capital flows impact on macroeconomic aggregates for a country. While summarizing, macroeconomic implications of capital flows, in particular in terms of effect on real exchange rate, depends considerably of financial openness, financial development and exchange regime applied. In general, there is a consensus among several studies on the role of financial development in the attenuation of the effect of real exchange rate appreciation due to capital flows (Athukorala and Rajapatirana, 2003; Otker-Robe, Polanski, Topf and Vavra, 2007; De la Torre, Gozzi and Schmukler, 2007; Acosta, Baerg and Mandelman, 2009 and Saborowski, 2009).

For developed and developing countries, to have a developed and active financial market is a project which required time and which its role will be clearer in the long run rather than in the short run. During our work, we will try to determine the nature of the role played by financial development in long-term relationship between capital flows and real exchange rate for a heterogeneous panel of developed and developing countries.

III. Empirical Evidence

Our study is elaborate on annual data covering period 1989-2011 for a heterogeneous panel of 38 developed and developing countries. The choice of countries retained in our work was founded on criterion of data availability for variables in definite period.

a) Presentation of Data

Dependent variable in our work is real effective exchange rate (REER). We employ an index of the real effective exchange rate based on consumer price index like a measurement of REER (calculated by author). In our study, an increase of the real effective exchange rate implies a real appreciation of the currency. Basing on the theoretical literature and in particular on the empirical literature of determinants of REER, the fundamental variables affecting REER, and which will be retained in this work, are terms of exchange (TOT), productivity (PROD), commercial openness (OUV) and monetary excess (MONEY). The dependent variable and fundamental determinants are expressed in logarithm.

Concerning the macroeconomic fundamentals, terms of trade (TOT measured like the rapport between unit values of exports and those of imports) have

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theoretically a contradictory impact on the equilibrium real exchange rate. This contradiction is explained by the nature of effects (income effect and substitution effect) which can dominate and operate the shocks of terms of trade. In the event of improvement in terms of trade associated with the rise of export prices, the income effect is expressed by an increase in income which as has consequence an increase in demand of goods, in particular, non-exchangeable if it is supposed that prices of imported goods are fixed. The increase in demand will cause later the rise of prices of non-exchangeable goods leading to the appreciation of real exchange rate. On the other hand, if the substitution effect dominates, the improvement in terms of trade, operated by the rise of export prices, results in the increase of supply of non-exchangeable goods favoring the decrease of their prices in order to absorb the surplus of supply. The decline of non-exchangeable goods prices has as repercussion a depreciation of real exchange rate.

Commercial Openness (Ouv): The variable openness (measured as the sum of imports and exports expressed as a percent GDP) acts as a proxy for commercial policy and it will tend to decrease exchangeable goods prices while minimizing or by avoiding the taxation of imports or the subventions on exports. This reduction in prices of exchangeable goods will have as a consequence a real depreciation of the exchange rate.

Productivity (Prod): productivity or also technological progress (PROD defined as domestic GDP per capita over the weighted average of GDP per capita of the principal trade partners) has for an object to hold in consideration the Balassa-Samuelson effect. According to this effect, the increase of productivity gains, which proves more concentrated in exposed sector, increases the wages in two exposed and sheltered sectors. Consequently, the demand of non-exchangeable goods increases, which increases the prices in non-tradable sector, while the prices of the exchangeable goods are approximated by world prices, this fact leads to a real appreciation of the exchange rate.

Monetary excess (MONEY measured by the ratio money over GDP) is an indicator of monetary policy. The rise of money results in increase of non-tradable goods demand and consequently in their prices, implying an appreciation of real exchange rate.
Concerning our variable of interest, several proxies exist for capital flows. During our analysis, we will use two indices as measures of capital flows: foreign direct investments (FDI) and the net foreign assets (NFA), both are expressed as a percentage of GDP. Generally, an increase of capital flows results in an increase of non-tradable prices, of this fact conducting to the appreciation of real exchange rate.

For measures of the variable financial sector development, there are several index of which most widespread are private credits provided by banks and other financial institutions as a share of GDP (this index measures precisely the activity of the money market), liquidity liabilities as a percentage of GDP (it is an indicator of financial market) and deposit money bank assets as a percent of GDP. In our work, we will adopt the three indicators in an alternative way to give more robustness to our conclusions and we will particularly be interested in private credit over GDP as a proxy of financial development for only reason is that the liquidity liabilities could not be strongly related to provision of financial services such as risk management and information treatment (King and Levine, 1993 and Saborowski, 2009).

b) Estimation Method

In the wake to determine the long-term effect of capital flows on real effective exchange rate by taking into account the level of financial development for developed and developing countries, the dynamic panel co-integration (error correction model, ECM) will be our technique of the estimate. The application of such technique requires that the variables should be integrated in order 1 (I(1)) and that it exists a long-term relation of co-integration between the variables of the model.

The first step of this econometric method consists to check if the data are non-stationary and to deduce that the variables are I(1). Various tests of unit roots for panel data exist in the econometric literature. We limit for two tests; test of Maddala and Wu (1999) and test of Pesaran (2007). Concerning the first, it is a test of the first generation. It proposes as assumptions the heterogeneity in autoregressive coefficient (AR) of the Dickey-Fuller regression and cross-section independence in the data. Whereas the test of Pesaran, which belongs to the second generation of unit root tests, supposes the cross-section dependent to the panel data and, as Maddala and WU, it takes into account the heterogeneity of autoregressive coefficients (AR) of the Dickey-Fuller regression.

After having checked that whole of variables are I (1), the second step allows to test the existence of a long-term relationship between the various variables components model to be estimated. Among the tests of co-integration in panel data, we find the test of Pedroni (2001) and the test of Kao. The limit of the test of Pedroni is that it cannot test the co-integration, more than seven variables. For this reason, we adopted the test of Kao.

If the tests of co-integration confirm that there is a long-term relationship between the variables, the last step consists to estimate this relation. Knowing that there are several techniques, on the one hand, the estimate method of a long-term relation of co-integration

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in panel data depends strongly on the treated question. Within the framework of our work, the fact that we expect that the long-term movements of the REER and their macroeconomic determinants are identical for all countries in the sample explains our passion for the PMG estimator (Pooling Mean Group) which supposes the homogeneity of long-term coefficients for all groups (countries), whereas, it supposes short-term heterogeneity. On the other hand, other methods to knowing the MG (Mean Group), it supposes the short-term and in particular the long-term heterogeneity of the coefficients. Contrary to MG, the dynamic fixed effects estimator (DFE) supposes the homogeneity in the short-term and in the long-term of coefficients. As the short-term behaviors of the REER are likely to be influenced by the specific characteristics of countries, the DFE estimator does not seem adequate. To justify our choice, the test of Hausman will be carried out during our estimates.

Analytically, the PMG estimator derives from the estimate of the error correction equation:

$$\Delta y_{it} = \emptyset_i y_{i,t-1} + \beta_i X_{it} + \sum_{j=1}^{p-1} \varphi_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \theta_{ij} \Delta X_{i,t-j} + \alpha_i + \varepsilon_{it} \quad (1)$$

Where $y_{i,t}$ is the dependent variable. X_{it} is the matrix of regressors. α_i is the fixed effects. φ_{ij} and θ_{ij} are respectively the coefficients on the lagged first-differences of the dependent variable and the independent variables. β_i is the matrix of coefficients of the independent variables. $\emptyset_i$ is the error-correction term represents the speed of adjustment. If $\emptyset_i$ is significantly negative, then there is a long term relationship between the dependent variable and the explanatory variables.

IV. Specification of Model and Estimation Results

In order to specify and estimate our model, the conditions of non-stationnarity of data and the existence of a relation of co-integration must be validated. In the continuation of our empirical work, the various tests and estimates will be carried out for the total sample and the two sub-samples of the country as they were defined above.

a) Specification of Model

The results of the unit root tests are presented in table 1 below. It arises from the reading of the table that the null hypothesis of non-stationnarity is not rejected at the 5% significance level for the real exchange rate, and for its explanatory variables in different country's groups. This conclusion is checked for the all specifications which introduces the individual specific-effects (which refer to the constant, C), and for that which includes both the individual specific-effects and an individual linear trend (which corresponds to the trend, T). In the case of developed countries, Maddala and Wu test with constant allows that all variables are non-stationary, except the FDI which are non-stationary only at the 1% level of significance. Whereas, including both constant and trend to the test of unit root, variables FDI and TOT are non-stationary only at the 1% level and the other variables are non-stationary at the three significance level.

Table 1 : Results of Maddala and Wu (1999) and Pesaran CIPS (2007) panel unit root tests

Variables	Developed Countries				Developing countries				Total Sample			
	1st Generation Test Maddala and Wu MW(1999)		2nd Generation Test Pesaran CPIS (2007)		1st Generation Test Maddala and Wu MW(1999)		2nd Generation Test Pesaran CPIS (2007)		1st Generation Test Maddala and Wu MW(1999)		2nd Generation Test Pesaran CPIS (2007)	
	C	C + T	C	C + T	C	C + T	C	C + T	C	C + T	C	C + T
REER	0.124	0.144	0.023**	0.004*	0.488	0.665	0.934	0.649	0.581	0.021**	0.213	0.335
TOT	0.337	0.017**	0.820	0.410	0.229	0.038**	0.060**	0.002*	0.006*	0.000*	0.218	0.003*
PROD	0.958	0.968	0.788	0.560	0.999	0.912	0.553	0.629	0.042**	0.315	0.999	0.989
OUV	0.699	0.171	0.035**	0.827	0.818	0.637	0.164	0.963	0.014**	0.921	0.858	0.348
Money	0.810	0.386	0.130	0.365	0.819	0.229	0.247	0.184	0.045**	0.069**	0.907	0.246
NFA	0.914	0.727	1.000	0.947	0.039**	0.861	0.993	0.916	1.000	0.998	0.296	0.895
FDI	0.040**	0.017**	0.022**	0.367	0.114	0.368	0.004**	0.372	0.101	0.877	0.022**	0.042**

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Private credits	0.952	0.774	0.104	0.029**	0.646	0.809	1.000	1.000	0.047**	0.887	0.922	0.886
Liqliab	0.939	0.795	0.160	0.097***	0.119	0.181	0.182	0.804	0.003*	0.374	0.525	0.451
Dep money	0.856	0.840	0.013**	0.015**	0.769	0.914	0.998	0.978	0.012**	0.377	0.906	0.958

***, ** and * corresponds respectively to the rejection of null hypothesis at 10%, 5% and 1%. The values presented in this table correspond to p-values. C and T refer respectively to constant and trend.

For Pesaran test, all variables are also non-stationary except for REER which is stationary introducing constant and deterministic trend to test. Concerning developing countries, the results for the two specifications of Maddala and Wu test prove that all variables are non-stationary for all significance level except the NFA (test with constant) and the TOT (test with constant and trend) are non-stationary only at the 1% level. While, the test of Pesaran indicates that only the variables FDI (test with constant) and TOT (test with constant and trend) are stationary for all significance levels. Carrying out unit root tests for the total sample, the results are almost identical to those found for each group independently. The only difference is that non-stationnarity hypothesis is not rejected for certain variables at weaker significance level (1%) and also variable TOT became stationary according to results of Maddala and Wu test (for the two versions) and of Pesaran test (specification with constant and trend).

Generally, the two tests of unit root show the nonstationnarity for all variables, particularly in the specification including only the individual specific-effects. Consequently, we can conclude that the various variables are integrated in order one (I(1)).

The nonstationarity of variables enables us to test the existence of long-term relationship between real effective exchange rate and the various combinations of explanatory variables. The cointegration tests in panel data of Pedroni (2001) and Kao are carried out. The results will be presented with the estimates of various specifications of REER model. It comes out from these results the presence of cointegration vector for all specifications of REER model.

After having checked the hypothesis of nonstationarity of variables and the presence of a long-term relationship between REER and various combinations of its determinants, the next step consists to estimate our equation at error correction. From the equation (1), the reduced form equation to estimate is as follows (Exception of variables Flow and FD, the other variables are expressed in logarithm):

$$\Delta(reer)_{i,t} = \emptyset_i\left[reer_{i,t-1} - \beta_0 - \beta_1 tot_{i,t} - \beta_2 prod_{i,t} - \beta_3 ouv_{i,t} - \beta_4 money_{i,t} - \beta_5 Flow_{i,t} - \beta_6 FD_{i,t} - \beta_7 (Flow * FD)_{i,t}\right] - \left[\theta_{1i}\Delta(tot)_{i,t} - \theta_{2i}\Delta(prod)_{i,t} - \theta_{3i}\Delta(ouv)_{i,t} - \theta_{4i}\Delta(money)_{i,t} - \theta_{5i}\Delta Flow_{i,t} - \theta_{6i}\Delta FD_{i,t} - \theta_{7i}\Delta(Flow * FD)_{i,t}\right] + \varepsilon_{it} \quad (2)$$

As the PMG estimator supposes the homogeneity of long-term coefficients, that means analytically $\beta_i = \beta$ for all *i = 1, 2, 3..., N.* The matrix *Flow* corresponds to two indicators of capital flows which will be adopted during our work (*FDI and NFA*). Matrix *FD* refers to three proxies of financial development variable (Private credits provided by banks and other financial institutions as a share of GDP, Liquidity liabilities as a percentage of GDP and Deposit money bank assets as a percent of GDP) and the matrix *Flow*FD* presents the term of interaction between the indicator of capital flows and the indicator of financial development. Since we are interested in the evaluation of long-term relationship between *REER* and the various combinations of its determinants only long term coefficients β which will be presented.

b) Estimation Results and Discussion

The object of this sub-section is to determine empirically the role played by the developed financial market in the effect of the capital flows on real effective exchange rate. To be done, we adopted two indicators of capital flows (*FDI* and *NFA*) and three indicators of financial development (private credits, liquidity liabilities and deposit money, all as a percentage of GDP). For each group of countries and for each indicator of financial development, two estimates of the equation (2) are carried out. The first regression corresponds to the use of FDI as index of capital flows whereas, *NFA* is employed as an index of capital flows in the second regression.

Choosing the *private credits* reported to GDP like our first indicator of financial development, the results of the PMG estimates of the equation (2) are recapitulated in table 2 below. The first result which we can draw from this table is that the coefficient of adjustment (corresponds to EC in the table and $\emptyset_i$ in the equation) is at the same time negative and strongly significant for both proxies of capital flows (*FDI* and *NFA*) and also for all samples. This means that there is a long-term relationship between *REER* and its determinants used in each estimate. Moreover, this result enables us to conclude that a potential endogeneity between *REER* and its fundamentals does

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not have an influence on the coefficients of long-term. Consequently, we conclude the absence of omitted variable bias in various estimates carried out and for the three samples of countries. The result and the conclusion are identical by choosing each time one of two other indicators of financial development; *Liquidity liabilities* as a share of GDP (table 3) and *Deposit money* as a percent of GDP (table 4).

Justifying the choice of PMG method, the result of the Hausman test shows that the null hypothesis of homogeneity of long-term coefficients is not rejected, for all significance levels and for all estimations carried out. This result is also checked in tables 3 and 4 (see below) respectively where liquidity liabilities over GDP and deposit money reported to GDP as alternative proxies of financial development. Consequently, we conclude that the PMG estimator is preferred that the MG method which supposes the heterogeneity of coefficients at short and long-term.

Examining the results of table 2 for the sample total, regression "I" shows that the coefficients of FDI and of term of interaction between FDI and private credits reported to GDP have opposite signs (positive coefficient and almost null for the variable FDI and negative for the term of interaction). This does imply that a real appreciation of the effective exchange rate due to an increase in capital flows can be attenuated when the volume of private credits as a percent of GDP is rather high. However, this conclusion remains weak as long as both coefficients are statistically not significant. Indeed, the coefficient of the variable FDI is strongly not significant (p-value equal to 0.915). Whereas, the coefficient of the variable term of interaction is not slightly significant since its p-value 0.124 exceeded slightly the significance level of 10%. Using the NFA like an indicator of capital flows, regression "II" shows that this indicator and its term of interaction with private credits as a share of GDP have also coefficients of opposite signs and with values almost null on the one hand and strongly not significant on the other hand. The results found for the NFA confirm those found for the FDI.

To have more significant results and consequently more robust conclusions, we chose to dis-aggregate our sample of countries in two groups according to the level of development of their economies, developed and developing countries. For the group of developed countries, regression "I" shows that all estimated variables are strongly significant at the 1% level, except for the variable term of trade (TOT). Concerning our variables of interest, FDI and term of interaction between FDI and private credits over GDP have coefficients with opposite signs (positive for variable FDI and negative for the variable term of interaction) and also strongly significant at the 1% level.

This result means that a high volume of private credits reported to GDP less extremely returns the appreciation effect of real effective exchange rate due to an increase in FDI flows. The deduced conclusion from regression "I" is strongly confirmed by the results of regression "II" by introducing NFA as an alternative proxy of capital flows. Indeed, the coefficient of the variable NFA has a positive sign and that of term of interaction (NFA* private credits) is negative as well as both coefficients are strongly significant at the 1% level. Compared to those of developed countries, the results of developing countries did not strongly change when NFA is retained as an indicator of capital flows (Table 2, Developing Countries and Regression II).

Table 2 : Financial Development Role in Capital Flows Effects on Real Effective Exchange Rate: Estimations Results of PMG Method

Dependent Variable : Log (REER)						
	Total Sample		Developed Countries		Developing countries	
	I	II	I	II	I	II
EC	-0.2508***	-0.2867***	-0.1743***	-0.1759***	-0.3060***	-0.3287***
	(0.000)	(0.000)	(0.007)	(0.005)	(0.000)	(0.000)
Log(TOT)	0.2325**	0.4434***	0.0022	0.3577**	0.4800***	0.7595***
	(0.012)	(0.000)	(0.990)	(0.030)	(0.000)	(0.000)
Log(PROD)	0.2506***	0.5519***	0.7522***	0.7067***	0.2040***	0.4887***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(OUV)	-0.1545***	-0.4952***	-0.3245***	-0.3610***	-0.1864***	-0.5593***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(MONEY)	-0.0395	-0.0110	-0.3052***	-0.1914***	0.0448	-0.0490
	(0.215)	(0.730)	(0.000)	(0.000)	(0.265)	(0.215)
Private credits	-0.0955***	-0.0880*	0.3479***	0.0522	-0.1138**	-0.3333**
	(0.006)	(0.075)	(0.000)	(0.408)	(0.013)	(0.041)
FDI	0.0006		0.0243***		0.0045	

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	(0.915)		(0.000)		(0.484)	
FDI*private credits	-0.0105		-0.0295***		-0.0112	
	(0.124)		(0.000)		(0.316)	
NFA		0.0003		0.0034***		0.0034**
		(0.684)		(0.004)		(0.040)
NFA*private credits		-0.0002		-0.0058***		-0.0015*
		(0.823)		(0.000)		(0.090)
Hausman Test	0.42	0.33	3.65	1.04	0.32	0.47
	(0.9997)	(0.9999)	(0.8186)	(0.9941)	(0.9999)	(0.9995)
Kao Test of Cointegration	-3.7769***	-3.7190***	-3.2952***	-3.0610***	-2.4819***	-3.1400***
	(0.0001)	(0.0001)	(0.0005)	(0.0011)	(0.0065)	(0.0008)
Threshold of FD proxy	-	-	0.82	0.59	-	2.26
Observations	796	796	393	393	403	403
Number of Countries	38	38	18	18	20	20
Log-Likelihood	1382.27	1371.065	760.9378	757.6281	649.4733	626.7935

***, ** and * corresponds respectively to significance at 1%, 5% and 10% level. EC refers to the error correction term and it corresponds to the symbol $\emptyset_i$ in equation (2). All specifications include a maximum of one lag according to Akaike criterion. Values in parentheses are p-values. For cointegration test of Kao, the null hypothesis is the absence of cointegration. For Hausman test, the null hypothesis is the restriction of the homogeneity of long-term coefficients.

Moreover, the coefficients related to NFA and term of interaction are respectively positive (0.0034) and negative (-0.0015). Whereas, the significance is strong for variable NFA (p-value is equal to 0.040) and it is weak for the variable of term of interaction NFA*private credits (p-value is 0.90). On the contrary, regression I for developing countries shows that, although they kept the same signs as the other regressions, the coefficients of FDI and term of interaction FDI*private credits are not strongly significant. The results found for developing countries show that a financial market is not developed or slightly developed is unable to weaken significantly the real appreciation effect of effective exchange rate following great flows of FDI. The weak results found in the case of developing countries had a greatest influence on no-significance of the results found for total sample, in particular for our variables of interest (two indicators of capital flows and its terms of interaction with the indicator of financial development private credits as a share of GDP).

Table 3 : Liquidity Liabilities as proxy of Financial Development, Capital Flows and Real Effective Exchange Rate: Estimations Results of PMG Method

Dependent Variable : Log (REER)						
	Total Sample		Developed Countries		Developing Countries	
	I	II	I	II	I	II
EC	-0.2199***	-0.2319***	-0.1890***	-0.1844***	-0.2361***	-0.1674**
	(0.000)	(0.000)	(0.001)	(0.003)	(0.000)	(0.010)
Log(TOT)	0.3060**	0.5725***	0.1898	-0.3899**	0.9527***	-0.0655
	(0.031)	(0.000)	(0.349)	(0.028)	(0.000)	(0.813)
Log(PROD)	0.6579***	0.6025***	0.6636	-0.0286	0.4732***	0.6444***
	(0.000)	(0.000)	(0.000)***	(0.782)	(0.000)	(0.000)
Log(OUV)	-0.3817***	-0.4432***	-0.3798***	-0.5375***	-0.1089***	-0.9024***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.009)	(0.000)
Log(MONEY)	-0.1404***	-0.1076***	-0.1923***	0.4971***	0.1770***	-0.1321**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.024)
Liqliab	0.0459	-0.0161	0.1410**	-0.0669	-0.0340	0.0074**
	(0.315)	(0.739)	(0.024)	(0.504)	(0.632)	(0.023)
FDI	0.0032		0.0078***		0.0197***	
	(0.609)		(0.007)		(0.000)	
FDI*Liqliab	-0.0004		-0.0101**		-0.0090	
	(0.950)		(0.014)		(0.329)	

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NFA		0.0030***		0.0083***		0.1508***
		(0.007)		(0.000)		(0.002)
NFA*Liqliab		-0.0055***		-0.0166***		-0.0572***
		(0.000)		(0.000)		(0.000)
Hausman Test	0.51	0.85	0.68	3.86	0.34	3.68
	(0.9994)	(0.9969)	(0.9985)	(0.7959)	(0.9998)	(0.8154)
Kao Test of Cointegration	-3.7541***	-3.6659***	-3.0993***	-3.3530***	-2.5086***	-3.3125***
	(0.0001)	(0.0001)	(0.0010)	(0.0004)	(0.0061)	(0.0005)
Threshold of FD proxy	-	0.55	0.77	0.5	2.19	2.64
Observations	796	796	393	393	403	403
Number of Countries	38	38	18	18	20	20

***, ** and * corresponds respectively to significance at 1%, 5% and 10% level. EC refers to the error correction term and it corresponds to the symbol $\emptyset_i$ in equation (2). All specifications include a maximum of one lag according to Akaike criterion. Values in parentheses are p-values. For cointegration test of Kao, the null hypothesis is the absence of cointegration. For Hausman test, the null hypothesis is the restriction of the homogeneity of long-term coefficients.

On six regressions presented in table 2, only three provided significant results for the indicators of capital flows and their terms of interaction with the private credits as a percent of GDP. In this context, we chose to determine the threshold level of the indicator of financial development for these three regressions.

Applying the method of PMG, the long-term relation between *REER* and its determinants is given by the following equation:

$$\widehat{reer}_{it} = \ddot{\theta}_1 tot_{it} + \ddot{\theta}_2 prod_{it} + \ddot{\theta}_3 ouv_{it} + \ddot{\theta}_4 money_{it} + \ddot{\theta}_5 Flow_{it} + \ddot{\theta}_6 FD_{it} + \ddot{\theta}_7 (Flow * FD)_{it}$$

Analytically, the calculation of a threshold level of financial development ($\widehat{FD}$) is given as:

$$\frac{\partial \widehat{reer}}{\partial Flow} > 0 \quad \leftrightarrow \quad \hat{\ddot{\theta}}_5 + \hat{\ddot{\theta}}_7 FD_{it} > 0 \quad \leftrightarrow \quad FD_{it} > \widehat{FD} = -\frac{\ddot{\theta}_5}{\ddot{\theta}_7}$$

The calculation of a threshold level of private credits provided by banks and other financial institutions as a share of GDP allows determine the level from which capital flows have a depreciation effect on the real effective exchange rate. In the table 2, the calculation of a threshold level of developed countries shows that on a level equal or higher than 0.82 of private credits as a percent of GDP, the flows of FDI have a depreciation effect on the real effective exchange rate. Also with a ratio equal or higher than 0.58 of private credits as a percent of GDP, NFA will have an impact to depreciate real effective exchange rate. While from a level higher than 2.26 of private credits as a percent of GDP, NFA will have a real depreciation effect on the effective exchange rate for developing countries. Comparing threshold levels for the two groups, we notice that threshold level for developing countries is strongly larger than that of developed countries implying that developing countries requires a higher level of private credits provided by banks and other financial institutions as a share of GDP (and consequently a financial market more developed) so that NFA depreciate their real effective rates of exchange.

Table 4 : Deposit Money as a proxy of Financial Development, Capital Flows and Real Effective Exchange Rate

Dependent Variable : Log(REER)						
	Total Sample		Developed Countries		Developing countries	
	I	II	I	II	I	II
EC	-0.2738***	-0.2521***	-0.1773***	-0.1801***	-0.3006***	-0.388***
	(0.000)	(0.000)	(0.008)	(0.006)	(0.000)	(0.000)
Log(TOT)	0.4973***	0.5710***	-0.0429	0.2867*	0.4403***	-0.2369
	(0.000)	(0.000)	(0.788)	(0.082)*	(0.000)	(0.334)
Log(PROD)	0.4667***	0.4433***	0.8234***	0.7342***	0.2204***	0.7007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(OUV)	-0.4594***	-0.5379***	-0.3020***	-0.3789***	-0.2349***	-0.5978***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(MONEY)	-0.0487**	-0.1257***	-0.2780***	-0.1702***	-0.0865***	0.5978***
	(0.044)	(0.000)	(0.000)	(0.000)	(0.005)	(0.000)

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Dep money	-0.0915**	0.1051***	0.2702***	0.01319	-0.1213***	-0.2923
	(0.020)	(0.006)	(0.000)	(0.810)	(0.006)	(0.549)
FDI	0.0094*		0.0229***		0.0011	
	(0.062)		(0.000)		(0.867)	
FDI*Dep money	-0.0037		-0.0250***		-0.0093	
	(0.425)		(0.000)		(0.373)	
NFA		0.0007		0.0039***		0.0209***
		(0.465)		(0.003)		(0.000)
NFA* Dep money		-0.0001		-0.0054***		-0.0214**
		(0.915)		(0.000)		(0.015)
Hausman Test	0.62	0.83	3.24	0.68	0.44	6.71
	(0.9989)	(0.9971)	(0.8621)	(0.9985)	(0.9996)	(0.4594)
Kao Test of Cointegration	-3.7290***	-3.8561***	-3.4149***	-3.2267***	-2.4659***	-3.4028***
	(0.0001)	(0.0001)	(0.0003)	(0.0006)	(0.0068)	(0.0003)
Threshold of FD proxy	-	-	0.916	0.72	-	0.98
Observations	796	796	393	393	403	403
Number of Countries	38	38	18	18	20	20
Log-Likelihood	1388.062	1381.704	766.4731	762.7878	643.2008	633.7525

***, ** and * corresponds respectively to significance at 1%, 5% and 10% level. EC refers to the error correction term and it corresponds to the symbol $\emptyset_i$ in equation (2). All specifications include a maximum of one lag according to Akaike criterion. Values in parentheses are p-values. For cointegration test of Kao, the null hypothesis is the absence of cointegration. For Hausman test, the null hypothesis is the restriction of the homogeneity of long-term coefficients.

Summarizing various results of table 2, two remarks and conclusion can be drawn. The first remark is that the no significance of the indicators of capital flows is explained by the fact that the flows of FDI and NFA for an economy are primarily directed towards the tradable goods sector. Consequently, they will have a weaker effect on the relative price of non-tradable and tradable goods (it is a ratio which define the real effective exchange rate). Another reason which can have a relationship to no significance of both indicators of capital flows in certain regressions is that flows of FDI and NFA are exploited in nonproductive investments (for example the investment in real sector or improvement of infrastructure). The second remark relates to no significance in some estimations of term of interaction between the capital flows proxy and the indicator of financial development. An explanation for this finding is that the indicator used for development of financial market is an indicator slightly fallacious because it can occur in certain cases that a substantial increase in indicator of financial development does not reflect necessarily a great capital flows. Consequently, it's unable to measure the capacity of financial sector to control in an effective way the capital flows, but it can reflect.

V. Conclusion

The volume of capital flows increased considerably in the last decade. This rise encouraged the monetary authorities to seek effective solutions to save the competitive capacity of their economies which can be degraded since a great capital flows appreciates real exchange rate considerably (Dua and Sen, 2006; Lartey, 2007; Sy and Tabarraei, 2010 and Jongwanich, 2010). Basing on the idea that a developed financial sector allows effective allocation of the external resources, we tried to specify the role played by financial development in the determination of capital flow's impact on the real effective exchange rate. To have more significant results and more robust conclusions, we chose to diversify the indicators of capital flows (FDI and NFA) and also the indicators of financial market development (private credits provided by banks and other financial institutions as a share of GDP, liquidity liabilities as a percentage of GDP and deposit money bank assets as a percent of GDP).

Basing on the cointegration techniques for 38developed and developing countries covering period 1989-2011, we tried firstly to check the hypothesis of nonstationnarity of variables by applying two tests of unit root in panel data suggested by Maddala and Wu (1999) and Pesaran (2007). The results showed that all variables are integrated in order one. Secondly, we showed that there is a long-term relationship between real effective exchange rate and explanatory variables, applying the cointegration test of Kao.

The application of the PMG estimator to an error correction model, which describes the behavior of REER according to capital flows and financial development, showed that a developed financial market can weaken

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the appreciation effect of capital flows on real effective exchange rate. Moreover, we calculated the threshold level of financial development which showed that from a certain level of financial sector development capital flows can have a depreciation effect on real effective exchange rate and this threshold level is very higher in developing countries than in developed countries.

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32. Never oversimplify everything: To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

33. Report concluded results: Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

34. After 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 though which your research is going to be in print to 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 in 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 criterion for grading the final paper by peer-reviewers.

Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of 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 the 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 evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

· Shun use of extra pictures - include only those figures essential to presenting results

Title Page:

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



Abstract:

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing 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 approach 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. Yet, use comprehensive sentences and do not let go readability for briefness. You can maintain it succinct by phrasing sentences so that they provide more than 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 maintain the initial two items to no more than one ruling each.

- Reason of the study - 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 quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness 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

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The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled 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 with every section. If you make the four points listed above, you will need a least of four paragraphs.



- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
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Procedures (Methods and Materials):

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement 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 for the least amount of information that would permit another capable scientist to spare 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 object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text 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:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not 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 - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in 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 a 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. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.



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Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise 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 in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to 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 part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

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The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a 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 implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly 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 with prospect, and let it drop at that.

- Make a decision if each premise is supported, 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 the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One 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 available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

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Introduction	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
Methods and Procedures	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
Result	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
Discussion	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
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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