THE AGGREGATE BIAS OF THE DISPOSITION EFFECT: EVIDENCE FROM IPO TRADING VOLUME OF COMPANIES LISTED ON IDX PERIOD 2000 - 2010

BACHELOR THESIS

Submitted as a requirement to complete Bachelor Degree (S1) at Bachelor Program of Faculty of Economics and Business Diponegoro University

Written by:

EDO SRI HARSANTO
12010110130167

FACULTY OF ECONOMICS AND BUSINESS
DIPONEGORO UNIVERSITY
SEMARANG
2014

APPROVAL

Author	: Edo Sri Harsanto
Student ID	: 12010110130167
Faculty/Consentration	: Ekonomika dan Bisnis / Manajemen
Title	: **THE AGGREGATE BIAS OF THE DISPOSITION EFFECT: EVIDENCE FROM IPO TRADING VOLUME OF COMPANIES LISTED ON IDX PERIOD 2000 – 2010**
Dosen Pembimbing	: Drs. A. Mulyo Haryanto, S.E., M.Si.

Semarang, 22 September 2014

Dosen pembimbing

(Drs. A. Mulyo Haryanto, S.E., M.MSi)

NIP. 195711011985031004

APPROVAL

Author	: Edo Sri Harsanto
Student ID	: 12010110130167
Faculty/Consentration	: Ekonomika dan Bisnis / Manajemen
Title	: **THE AGGREGATE BIAS OF THE DISPOSITION EFFECT: EVIDENCE FROM IPO TRADING VOLUME OF COMPANIES LISTED ON IDX PERIOD 2000 – 2010**

Has passed the examination on **September, 30 2014**

Examiners:

1. Drs. A. Mulyo Haryanto, S.E., M.Si. (.....)
2. Dr. Harjum Muharam, S.E., M.E. (.....)
3. Dr. Irene Rini D.P., S.E., M.E. (.....)

BACHELOR THESIS ORIGINALITY STATEMENT

I am who undersigned here, Edo Sri Harsanto, claimed that bachelor thesis entitle The Aggregate Biases of The Disposition Effect: Evidence from IPO Trading Volume of Companies Listed on IDX Period 2000 – 2010 is my own writing. Hereby I declare in truth that this bachelor thesis there is no others' writing as a whole or as a part which I took by copy or imitate in a form of sentences or symbol which represent writers' ideas or opinion, which I admitted as my own, and/or there is no a part or a whole writing which I copied, or I took from others' writing, without giving consent to its original writer.

Hereby I declare if I took action contrary to the matters above, whether it's on purpose or not, I will take back my proposed bachelor thesis which I admitted as my own. Later on if it's proved that I copied or imitated other's wrinting as if it was mine, I'll let my academic tittle and certificate which has given to me to be invalidated.

Semarang, 22 September 2014

Edo Sri Harsanto
NIM. 12010110130167

MOTTO

I did not want anything in this world.

I just wanted to look my family happy, just want to look their smile.

I just want to enjoy my life

"I dedicated this for you, Ibu, Bapak, Adik, and People that I loved"

I am so grateful for anything that you were given.

ACKNOWLEDGEMENT

All praise and gratefulness to Allah SWT, because only with His mercy and grace, the thesis with title The Aggregate Biases of The Disposition Effect: Evidence from IPO Trading Volume of Companies Listed on IDX Period 2000 – 2010 has finally accomplished.

This thesis is a final assignment for Bachelor Program, Management Department, Finance Management Concentration, Faculty of Economics and Business, Diponegoro University. During the making of this thesis, I have received many helps and endless support from many people in which I really grateful of. In form of my gratefulness and appreciation, I would like to say my gratitude to (in Indonesian language):

1. Prof. Drs. H. Mohammad Nasir, M.Si., Akt., PhD, selaku Dekan Fakultas Ekonomika dan Bisnis Universitas Diponegoro yang memperkenankan saya untuk menulis skripsi ini.
2. Drs. A. Mulyo Haryanto, S.E., M.Si., selaku dosen pembimbing yang memberikan arahan kepada saya tentang apa yang harus dibenahi. Jadi ingat pertama kali bimbingan sebelum lebaran tahun 2014, Cuma nyerahin bab 1 – bab 3. Bimbingan ke 2 revisi bab 1 – bab 3 sambil nyerahin hasil intepretasi di bab 4. Bimbingan ke 3 finishing akhir. Maaf ya pak mulyo aku cuman 3x bimbingan, bukannya sombong, tapi aku cuman ingin tahu seberapa jauh aku bisa membuat riset ini

sendirian. Soalnya sudah 2 kali aku riset dibimbing oleh Pak Rizal dan Pak Erman, jadi untuk skripsi ini aku ingin mencoba jalan sendirian buat mengukur seberapa jauh Edo Sri Harsanto bisa melangkah, hehe.

3. Rizal Hari Magnadi, S.E., M.M selaku teman, saudara, dan dosen. Terimakasih ya pak selama ini sudah buanyaaaaaak sekali bantu aku. Aku pertama kali diajar sama Pak Rizal waktu pelajaran Manajemen Strategik, Pak Rizal dosen termuda yang pernah aku lihat selama kuliah sampai semester 4, dosen agak alay hahaha. Tapi Boz Rizal ini jago sekali, pandai, dan selalu mencari cara untuk tampil beda dan menjadi lebih baik.

   Jadi ingat pertama kali diberi pekerjaan sama Pak Rizal untuk riset tentang rumah sakit. Hasil riset itu yang nantinya menjadi sebuah pengalaman pertama yang tak terlupakan: The Relevancy of Using Website for Promoting Healthcare Product and Service. Itu adalah judul hasil riset tentang rumah sakit yang mana dipresentasikan di Call for Paper Ubaya (Insyma) ke 9 di Bali, 16 Maret 2014. Udah dapat kesempatan presentasi di tingkat internasional udah gitu nggak ngeluarin uang sama sekali, semuanya diurus sama Pak Rizal. Terlebih lagi sejak riset itu aku lolos seleksi keterima kerja di Sosro jadi surveyor riset marketing. Di sana aku dapat pengalaman buanyak sekali tentang marketing strategi. Dan masih buanyak lagi kegilaan kegilaan lainnya: ngomongin dosen-dosen lain, ngebuli panuntun,

nonton konser, dan lain-lain. Terimakasih Mr. Rizal Hari Magnadi, semoga suatu hari nanti aku bisa membalas semua budi baikmu, aminn.

4. Erman Denny Arfinto, S.E., M.M., selaku dosen, ayah, dan bos yang telah memberikan buanyak sekali hal. Pertama kali diajar sama Pak Erman waktu matematika bisnis, ini dosen bukanya cerita materi malah ngomong panjang lebar sampai sana-sini ahahha. Tapi aku tahu kalau beliau itu pinter banget. Pernah di semester 3, ada kuliah manajemen keuangan kelas internasional yang diampu Pak Erman, tapi kampret aku nggak kebagian kelas akhirnya aku minta tambah kelas di PD 1, sampai minta daftar list anak-anak yang ada dikelas itu, aku cari nomor hp nya aku telfon satu persatu aku tanya siapa yang mau pindah kelas, akhirnya dapat 1 kursi hahaha.

   Pak Erman juga ngebimbing aku di riset ke-2 tentang Financial Inclusion, waktu KKN aku bolak-balik bimbingan Semarang-Kendal untuk kejar deadline batas akhir pengumpulan paper. Alhamdulilah risetnya keterima dan dipresentasikan di Call for Paper Forum Manejemen Indonesia ke-4 di Pontianak. Semua biaya dan akomodasi diurus sama Pak Erman dan Pak Rizal, terimakasih yang kedua untuk kalian. Setelah itu aku jadi asisten nya Pak Erman, beruntung banget karena anak-anak HMJM itu pada nolak jadi asisten Pak Erman.

Lumayan jadi asistennya Pak Erman selain dapat ilmu dan pengalaman kerja, setiap hari makan gratis hahaha.

5. Dr. Hardjum Muharam, S.E., M.M, selaku dosen, boz dan juga ayah dikampus. Pak Harjum juga pandai, beliau juga punya visi untuk terus maju, maju, dan maju. Cara berfikir beliau tidak idealis, tapi apa yang bisa kita lakukan dengan apa yang kita miliki detik ini. Oleh Pak Harjum, Laboratorium Manajemen didirikan, sementara dibiayai oleh uang pribadi beliau dan Pak Erman. Ketua asisten laboratorium yang pertama adalah Nurul Hakim angkatan 2009, beta yang kedua setelah Hakim keluar.

   Sampai skripsi ini direvisi, Laboratorium Manajemen sudah menghandle 4 proyek besar: Studi Pengembangan Pelabuhan Tanjung Emas (Pelindo III), Studi Penyeleksian Investor Baru untuk PT. Sarana Patra Hulu Cepu (SPHC), The First International Conference on Finance and Banking (IFMA), dan Studi Kelayakan Pembangunan Kawasan Industri Kabupaten Tegal. Terimakasih Pak Harjum atas kesempatannya, semoga Laboratorium Manajemen jadi organisasi raksasa suatu hari nanti yahh, aminn.

6. Dr. Suharnomo, S.E., M.Si, selaku ketua jurusan manajemen dan ayah dikampus juga. Aduh Pak Nomo ini baik sekali, beliau sangat humoris, tapi kalau lagi panas, bahhhh semua disikat. Terimakasih untuk project besarnya ya Pak Nomo IFMA dan SPHC. Sampai-sampai gara-gara

ikut project SPHC aku ditawarain untuk kerja disana, padahal sidang aja belum. Tapi karena belum lulus jadi nggak bisa kerja disana deh.

7. Mom, Dad, Brother Thanks for everything, I love you nggak ada matinya. Aku sayang banget sama Bapak, Ibu, dan Adik. Selama ini kita hidup susah bareng-bareng. Mulai dari gaji yang habis di minggu ke-2 gara-gara buat bayar hutang, sampai berantem gara-gara hal yang gak penting.

   Aku nggak pernah berdoa supaya skripsi ini cepat selesai, aku juga nggak berdoa supaya dapat kerja setelah lulus kuliah. Aku sadar nggak semua doa akan dikabulkan. Aku takut kalau doa adalah *Trade-Off*, seperti *Oportunity Cost* dimana harus ada doa yang dikorbankan agar doa lainnya dikabulkan. Aku nggak menginginkan apapun di dunia ini. Aku cuman pengen melihat kalian tersenyum bahagia, melihat kalian tersenyum lebih lama lagi. I love U nggak ada matinya, I love bingit lah pokok e.

8. Management Laboratory Squad: Novita Indah Nugraheni, Awan Yogatama, Nurul Hakim, Tara Ninta, Aisyah Oktasari Dian Pertiwi, Frisca Devi Choirinia, Revanda Pramudia, Hendy Aprilian Hidayat, Novan Reza Pahlevi, Nabila Hanun Farida Athoamar, and Adit Dharmawan. Aku beruntung sekali dipertemukan oleh kalian semua. Aku belajar banyak dari kalian, mulai dari hal yang penting sampai hal

yang konyol sekalipun. Aku percaya setiap orang punya keahlian masing-masing, nggak bisa di pukul rata.

Aku pasti bakal kangen banget sama momen-momen waktu kita bersama-sama. Cari data ke Tanjung Emas, makan siang nasi padang di lab manajemen, karaokean bareng, waktu acara IFMA di Bali; nyanyi-nyanyi di mobil, sarapan pagi di Bali Jepun, bersantai di Pantai Kuta, jalan-jalan ke DreamLand, GWK, Jimbaran, makan bareng di Lombok Idjo, lembur dihari sabtu, olah data bareng-bareng, saling membuli satu sama lain gara-gara jomblo (jomblo isu paling sensitif di lab manajemen), pada saling ngerjain waktu sidang skripsi dan setiap hari pulang malam gara-gara dota dulu.

Momen-momen yang nggak akan pernah terlupakan seumur hidup. Terimakasih semuanya, aku setiap hari berdoa semoga Allah memberikan perlindungan dan kesuksesan buat kalian semua. Semoga kita diberi umur panjang biar bisa reunian di esok hari nanti, aminn.

9. My best friend in SMA 3 Semarang; Pandu, Kliwon, Jhony, Ahong, Jati, Somad. Ini grup cacad yang dipertemukan di SMA, masih awet sampai sekarang soalnya pada di Semarang semua. Tiap ketemu kerjaannya ngrasani orang mulu, ngakak sampai salto & guling-guling ngomongin cewek, sama hal-hal jorok lainnya, hahaha cacad banget.
10. Special thanks buat Irfan Nasution yang menemani kegalauan waktu bikin skripsi, si jomblo, galau, tukang speak, tukang php, otak mesum,

nggak guna sama sekali, semoga kamu sukses bro, amin. Buat Nafilah Laila yang udah mempertemukan saya sama Pak Rizal, mungkin kalau nggak kenal sama Pak Rizal nggak bisa sejauh ini beta melangkah. Buat Retno Sugiarti (UPK) terimakasih udah bantuin ngolah data panel eviews, nggak ada mbak retno bisa-bisa ikut rombongan wisuda Januari, hihih.

11. All lecturers and employees in Faculty of Economics and Business Diponegoro University, for all the given knowledges and suports during my time.
12. All contributors which I couldn't mention one by one, you know who you are. Thank you so much.

I admit that there are still many lacks in this thesis, Therefore, I gladly accept all criticism and advise in order to improve this thesis. At last, I hope that this thesis will contribute knowledge to public, civitas academic and for me.

Thank you very much

Semarang, September 23, 2014

Edo Sri Harsanto

ABSTRACT

The disposition effect means as Holding Losers to Long and Holding Winners to Short. This disposition effects' behavior is motivated by loss-aversion. This is proofed in the prospect theory by Daniel Kahneman and Amos Tversky (1797) that investor tends to be risk-averse in the domain of loss but risk-seeking in the domain of gain. Almost all of previous research about the disposition effect which was documented said that this behavioral bias of the disposition effect is happen among investors both young, old, men, women and amateur or professional. Nevertheless, are the dispositions effects of individual investors can be seen at aggregate market level? This research is designed to investigate IPO trading volume to looking for whether the disposition effect can be seen at aggregate market level. In IPO, almost all of investors have the same offer price relatively.

The samples of this research are 189 firms which have already done the IPO activity on period 2000 – 2010. The method of this research is statistical analysis by regression analysis divided by two steps. First, the model (7 independent variables) of each firms are regressed separately. Second, OLS pooled regression will be done with the residual of the first step regression as dependent variable. Three (3) dummy variables are added in this second step regression. The subsamples of this research are 80 firms.

The result shows that the disposition effect behavior can be seen at aggregate market level. Trading volume is lower when the stock traded below vs. above the offer price. Almost of all of t-values are negative when stock traded below the offer price and turn to positive once when stock traded above the offer price. For losers, shares' turnover also increases significantly once when stock crosses the offer price from below for the first time. For winners, it does not strong enough to support the disposition effect. Trading volume does not increase when the stock close to the offer price from above for the first time. Trading volume is increase when stock crosses level 1.15 and 1.20 of offer price.

Keyword: IPO, Trading Volume, Loss aversion, Disposition effect, Aggregate bias

ABSTRAK

Disposition Effect diartikan sebagai *Holding Losers to Long and Holding Winners to Short*. Perikalu *Disposition Effect* ini dimotivasi dari keengganan investor untuk merealisasikan rugi. Hal ini dibuktikan dalam *Prospect Theory* oleh Daniel Kahneman dan Amos Tversky yang mengatakan bahwa investor akan menghindari risiko di area untung (return) tetapi mencari risiko di area rugi (loss). Hampir seluruh penelitian tentang *Disposition Effect* yang terdokumentasi mengatakan bahwa perilaku bias *Disposition Effect* terjadi dikalangan investor baik muda, tua, laki-laki, perempuan dan amatir maupun profesional. Masalahnya apakah perilaku bias investor individual ini dapat dilihat secara aggregate pasar? Penelitian ini menginvestigasi IPO trading volume untuk mencari tahu *Disposition Effect* secara aggregate. Dalam IPO, seluruh investor perdana memiliki *purchase price* yang relatif sama.

Sample dalam penelitian ini adalah 189 perusahaan yang melakukan *Corporate Action* IPO dalam kurun periode tahun 2000 – 2010. Metode penelitian ini adalah analisis statistik dengan menggunakan alat analisis regressi terbagi dalam dua tahap. Tahap pertama, model (7 independen variabel) diregresi untuk masing-masing perusahaan secara terpisah. Tahap kedua, dilakukan regresi data panel dengan error (*residual*) dari masing-masing model tahap pertama sebagai dependen variabel dan ditambahkan 3 dummy variabel untuk menangkap perilaku *Disposition Effect*. Subsample dalam penelitian ini sebanyak 80 perusahaan.

Hasilnya, perilaku *Disposition Effect* dapat tercermin dari rendahnya turnover saham ketika saham tersebut diperdagangkan dibawah *purchase price* daripada saham tersebut diperdagangkan diatas *purchase price.* Untuk saham ‘losers’, turnover saham juga meningkat secara signifikan pada hari dimana harga saham tersebut melewati *purchase price* untuk pertama kalinya. Untuk saham ‘winners’, secara keseluruhan tidak ditemukan cukup bukti untuk perilaku disposition effect. Trading volume tidak meningkat signifikan dihari dimana harga saham turun mendekati offer price untuk pertama kalinya. Trading volume justru meningkat ketika harga menyentuh level 1.15 dan 1.20.

Keyword: *IPO, Trading Volume, Loss aversion, Disposition effect, Aggregate bias*

CONTENTS OF TABLE

LIST OF TABLE

LIST OF FIGURE

CHAPTER I

INTRODUCTION

1.1. Research Background

We know that investors have to make a decision whether to buy, sell, or hold. It turns out that they do not always act as fully rational expected utility maximizes as would be predicted by the neoclassical theory of finance (Sherfin, 2000). Over the last 40 years a large number of behavioral inclinations affecting the process of financial decision-making have been documented (Szyszka and Zielonka).

Investors, of course, prefer to get a gain rather than get a loss when they make an investment because the main purpose of investment is to get return. It is means that investors in overall dislike to sell their shares at a loss because investors will face with loss itself. This reluctance to realize their losses can be motivated by the loss aversion in prospect theory (Kahneman and Tversky, 1979) which says that the relation of an asset's price to an investor's reference price affects the investor's utility asymmetrically: The Investors will be risk-averse in the domain of gains, but risk-seeking in the domain of losses.

That behavioral biases, documented in prospect theory (Kahneman and Tversky, 1797), provide one explanation for the 'disposition effect'. Competing

explanations include investors belief (rational or not) that today's losers will be tomorrow's winners, investor selling winning stocks to restore diversification, or investor's reluctance to sell losers due to the higher transaction cost associated with lower-priced stocks.

Another dominant hypothesis in finance, that markers are efficient is based on the premise that investors are rigorously rational. Rationality works well as a first order approximation of investor behavior although we now recognize that behavioral biases can induce trading pattern at odds with the implication of economic rationality. This paper focuses on one such bias, investors' reluctance to crystallize investment losses relative to gains, i.e., the 'disposition effect' (Shefrin and Statman, 1985), but we focus on the aggregate market level.

The disposition effect was described as the "effect, whereby investors are anxious to sell their winners, but reluctant to sell their losers" (Sherfrin 2005, p.419) or "the tendency to hold losers too long and sell winners too soon" (Odean 1998, p.1775). The disposition effect can be considered as an implication of the prospect theory which says that investors exhibit an S-Shaped valuation function (Kahneman and Tversky, 1979). Investors avoid risk in the case of potential gains and seek risk in the case of potential losses. Avoiding risk makes investors tend to sell the winner stock once because of their regret if the stock prices will be fall anymore or pride of getting return and seeking risk make investors tend to hold the losers stock once because of their regret that they are in the 'black area' or hope that stock price will be increase in tomorrow.

Figure 1.1
S-Shape Utility Function Curve

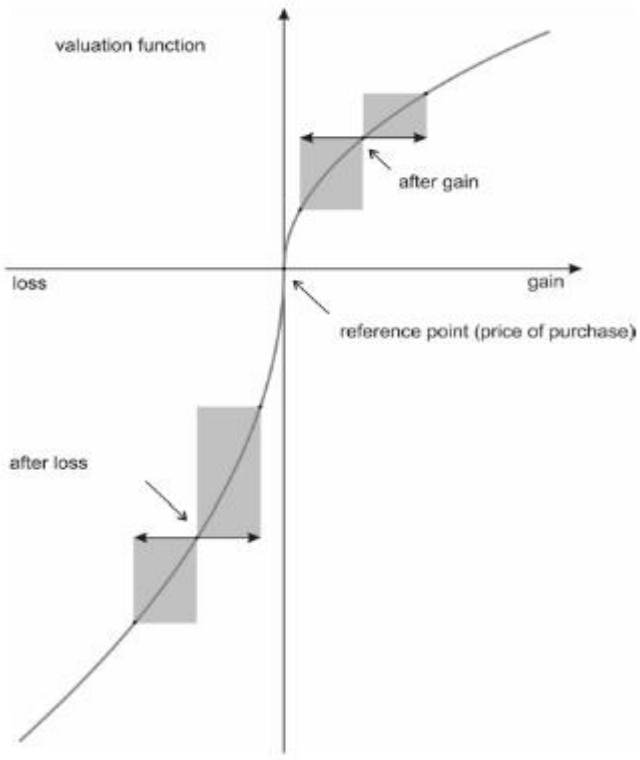


Figure above presents attempts at explaining the disposition effect that states that investor holding losers too long and selling winners to short. A shares being sold faster after gain than after loss was explained by the S-shaped utility function. After a gain the diminishing curvature of the utility function makes an investor tend to sell a share because the utility of further share price growth is smaller than the utility of further share price drop of the same value.

The tendency of investors to hold their losing stocks to long while selling their winning stocks to quick is one of the best-documented behavioral trading biases. This tendency labeled the disposition effect by Shefrin and Statman

(1985), has been documented in individual as well as institutional investors, and in a variety of financial markets throughout the world. Another research documented the disposition effect from another aspect: age, gender, manage by individual or professional investor, what factors drive the disposition effect, etc. The disposition effect has lately gained validity as an explanation for many market anomalies.

For example, Frazzini (2006) shows how the disposition effect can explain the post-announcement price drift in earnings announcements, and Goetzmann and Massa (2008) show that disposition effect can help explain stock volatility, returns, and trading volume. It has also garnered much attention as a possible driver of momentum.Based on loss aversion Shefrin and Statman (1985) present a framework where investors have a disposition to hold on to losing investment and to sell winning investment early.

The disposition effect is well documented empirically among future traders (Heisler, 1994; Locke and Mann, 2000), individual stock market investors (Odean, 1998; Shapira and Venezia, 2001; Grinblatt and Keloharju, 2001), as well as individual home owners (Genesove and Mayer, 2001), among investors classes (Brown and Chappel, 2006). Disposition effect and momentum (Birru, Justin, 2012; Shumway and Wu, 2006), demonstrated on IPO Trading Volume (Szyszka and Zielonka; Kaustia Markku, 2004).

The Disposition Effect can be analyzed from various perspectives': individual, group, and aggregate. The Individual perspective concerns the decision making process itself. Weber and Camerer (1998) on their research made an

experimental analysis showing that, contrary to Bayesian Optimization, subject were selling winners and keeping losers. Daccy and Zielonka offered a time-independent explanation of the disposition effect implementing a probability of the future price change.

The Group level of the disposition effect refers to the characteristic of particular groups of investors. The demographic and socio-economic data is used by Dhar and Zhu (2002) as proxies for investors' sophistication. They found those investors in professional weal and their investors' occupation to be less prone to the disposition effect. Shapira and Venezia (2001) compared investors who making a decision (sell, buy or hold) by their self to those whose accounts were managed by brokerage professional. They found that both individual investors and managed by professionals exhibit the disposition effect, but that effect is weaker for managed by professional.

Locke and Mann (2005) examined the discipline of professional traders versus their tendency to exhibit the disposition effect. They defined 'discipline' according to two factors: First, the adherence to trade exit strategies, measured by the general speed of trading. Second, the avoidance of riding losses, determined by the magnitude of paper losses per contract held for a long time. They found that more discipline traders were more immune to the disposition effect.

Feng and Seasholes (2005) tested what impact the level of an investor's sophistication has on his exhibition of the disposition effect. The number of trading rights, the initial portfolio, diversification and two demographic variables (gender and age) are defined as proxies of investors' sophistication. Their research

proved that neither sophistication nor trading experience alone eliminated the disposition effect. Both of them together were able to eliminate investors' reluctance to realize losses; however they did not fully eliminate the propensity to realize gains.

Men were more likely to realize losses than women. Younger investors (under 35) were more likely to realize losses than older ones. From the discussion above make a conclusion that the group level research shows that the disposition effect happen in all investors but more strong in less experienced individual rather than among professionals. This indicates a possible influence on assets pricing.

The aggregate level of the disposition effect is defined as that exhibited on the market. Behavioral finance researchers have discovered a number of cognitive and motivational inclinations but the main question still unanswered is what impact the individual biases have at the aggregate market level (Szyszka and Zielonka). Some researchers suggest that individual biases are eliminated at the market level (heterogeneous investors, learning). The market can be thus unbiased if all investors behave rationally (Oehler et al, 2003). However, we take a different position and argue that individual's mistakes, human misjudgments and behavioral inclinations do not always cancel out and may demonstrate also at the aggregate market level (Szyszka and Zielonka).

The explanation above about the disposition effect both on the individual level and group level make us lead to one conclusion: The disposition effect happen in all case. If the disposition effect proved happen in all case, it should also happen in the aggregate market level and show up because aggregate market

level is represent of individual and group investors. The disposition effect can be associated and should be seen on trading volume.

Trading volume is represent of bid-ask behavior, bid-ask is identic to supply and demand, and supply and demand is made by investor both individual and group investors. So if we want to look the disposition effect as a behavior of investor we can look from trading volume. Generally, the increase of trading volume when stock is trading above than below the offer price or on a given price range level may indicate the disposition effect.

The purpose of this research is aim to look whether the disposition effect can be seen on aggregate market level. The subject to this research is all IPOs' activity on Indonesia Stock Exchange (IDX) during 2000 – 2011 periods. To be more specific, this research focused on capturing the disposition effect by investigates the turnover volume of stock. This allows for a direct comparison with previous findings and research which basically have similarities with this research such as Kaustia Markku (2004) and Szyszka and Zielonka.

In 2004, Kaustia Markku examines the market-wide impact of the disposition effect; evidence from IPO trading volume. He studied empirically the market-wide importance of investors' reluctance to realize their losses by investigating IPO trading volume. Kaustia give an opinion that in IPO all initial investors have a common purchase price, so the disposition effect should be at its strongest because in no other situation in the stock market is there as clear a setting to investigate the disposition effect in aggregate. He investigates the

importance of different reference price for the stock market as an aggregate by examining IPO trading volume.

The first step regression results show significant for market turnover for over 50% of the firm. The next result of step two regressions also indicates the disposition effect on losers stock but not happen in winner stock. On the given price range level, the volume is clearly lower when the stock is trading below the offer price. The price range dummies are almost all negative below the offer price, otherwise the price range dummies are positive and significant above the overprice for losers. The summary of results shows the disposition effect on losers stock but for winners IPOs' do not offer clear support for the disposition effect.

(Szyszka and Zielonka) divided the sample of IPO's into two group "winner" – shares that generated positive return between the first listing and the IPO's offers, and "losers" – shares that made negative return on their debut. The U Mann-Whitney test showed a statistically significant positive difference between the turnover volume of positive initial rate of return shares (winners) and negative initial rate of return shares (losers) for all turnover measures. The result also indicated that the turnover volume of positive initial market-adjusted rate of return shares is significantly higher than of the negative initial market adjusted rate of return.

The turnover of positive initial return of stock is higher than the negative initial return indicated that investors sell their shares at the time they gain a return and hold the shares when they are at losses. This phenomenon associated with the loss aversion in prospect theory. (Szyszka and Zielonka) said that this observation

is due to the disposition effect exhibited by individual investors. Therefore, if the disposition effects happened, trading volume should be higher when the stock is trading above the offer price vs. trading below the offer price, if investors are reluctant to trade lossmaking shares.

So, from the explanation above, the conclusion is there is a relation between trading volume on aggregate market level with the disposition effect, the researches above proved the statement with various measurements. Nevertheless, there is also a difference between those researches, whether the disposition effect happen in winner stock or not. One researcher said that the behavioral in winners stock is not strong enough to support the disposition effect, and another said that the disposition effect happen in both losers and winners stock.

I also criticized one of hypothesis of Markku Kaustia research (2004) which said that disposition effect happen on the winners stock if there is an increase in trading volume once when the return index or price indicated crossing the purchase price for the first time from above. This is contrast with prospect theory which said that on the loss area investor tend to hold their stock, not sell it. So if there is an increase on the first crossed of purchase price, there is no disposition effect behavior on the winners stock. This record will be explained more specific on the research problem.

This research also add some variables which used by researcher before that play important role to explain the disposition effect on aggregate market level. The variables will help in understanding on how investor behaviors lead to the disposition effect. This research used two step of regression to determine the

disposition effect on aggregate market level. The first step of regression is to determine the normal trading volume and the second step of regression is to capturing the disposition effect.

First, I used a regression to capture the normal trading volume, and then i run a pooled regression as a second step regression to capture the disposition effect. The variables used on the first step regression are daily turnover of firm, turnover variables including lagged turnover, and stock return variables including positive return, negative return, volatility, lagged return.

Second, I used an OLS pooled regression with some dummy variables to capture the disposition effect. The dummy variables used are given price range level, event of crossing the offer price from below for losers stock and event of crossing the offer price from above for winners stock.

Currently there is no generally accepted method for measuring abnormal trading volume. Similarly with recent studies (Kaustia Markku, 2004; Smith Bamber et al. 1999, Chordia and Swaminathan, 2000), I use turnover (number of shares traded divided by the number of shares outstanding) as a measure of volume. Daily firms' turnover is number of shares traded divided by number of shares listed. The daily firms' turnovers are calculated separately for each firm.

Lagged volume is turnover of volume before the observation day ex. Day minus 1 or 2. Gallant et al. (1992) find complex nonlinear interactions between prices and volume in both lagged and contemporaneous effect, suggest that large price changes lead to increases in both the mean and variability of the volume.

They also examine the relationship that lagged volume has on current price changes and volatility; abnormally high and low volumes are associated with slightly increased future price volatility. They suggested that movements in lagged volume, coupled with a similar movement in lagged price and increases in volatility.

Return is defined as the compensation in investment. Investment return divided into two components, which is yield and capital gain (loss). Yield reflects the cash flow or income derived from an investment periodically. The form of yield is different depends on the kind of investment. Interest is yield for bond or deposit money and dividend is yield for stocks. Capital gain is a profit acquired when there are increase in stocks or bond price, and capital loss if the price is decreased.

Return calculated by price change movement. In other hand, volatility is a tendency of price movement, calculated by return square. More detail, the daily trading volume is positively and nonlinearly related to the magnitude of the daily price change. The finding of an unconditional volume-volatility relationship is consistent with many other studies [Tauchen and Pitts (1983), Karpoff (1987)]. Lamoreux and Lastrapes (1991) also find a positive conditional volume-volatility relationship in their models. They found that large price movement associated with higher subsequent volume; price changes lead to volume movements. I separate the positive and negative return when calculate abnormal turnover in step one regression as contemporaneous return.

On the second step of OLS pooled regression I use some dummy variables to capture the disposition effect. Given price range level variables is a variable to show the investor behavior of the disposition effect. If the disposition effect is really happen it should show up on the trading volume when the price is traded below rather than above the offer price. Based on the prospect theory that states risk-aversion increase when investors have made a gain and decrease when loss. Hence, prior gains lower current demand for the asset and prior losses increase it, so that investors might want to sell winners and hold or even escalate their commitment to losers.

So, dummy variables are added on the given price range used return index examples: range 0.00 – 0.10, 0.10 – 0.20, 0.30 – 0.40, 1.00 – 1.10, 1.10 – 1.20, etc. These price range dummy variables, later, used for explaining the third hypothesis that trading volume is higher when the stock traded above than below the purchase price. Just like prospect theory said that investor tend to hold the stock when the price is below purchase price and sell when the stock above the purchase price.

Event of crossing the offer price can be parameter to capture the disposition effect. It is based on the regret theory that believes a sense of regret resulting from loss is stronger than a feeling of pride due to gaining a profit. In another research (Shiller, 1999) argued that "Regret theory may apparently help explain the fact that investors defer the selling of stocks that have gone down in value and accelerate the selling of stock that have gone up in value" (p. 1313). Suggested by (Sherfrin and Statman, 1985), regret is sometimes put forward as an

explanation for the disposition effect: Investors might feel regret when they realize a loss, and, conversely, feel pride when they realize a paper gain.

In case of the disposition effect, if investors, in the first trading day, buy losers stock (stock with negative initial return). They should hold the stock because their reluctance to realize their losses and this is motivated by loss aversion. Of course loser's investor will wait the stock until the price exceeds the offer price if they want to sell their stock to get a return. If investors hold a losers stock in a given period, the immediate effect should be seen while the market price of an IPO with negative initial return exceed the offer price for the first time, trading volume should increase because many investors sell their loser stocks.

If the disposition effect is significant enough to affect asset pricing, it should show up on trading volume (Kaustia Markku, 2004). This is also consistent with (Sherfrin, 2005) that investors hold winners too soon. Conversely, if the disposition effect is not an important determinant of trading volume, its asset pricing implications is perhaps not significant. So, dummy variables of event of first crossing are added to capture the disposition effect and their magnitude, especially when return index on the level 1.00 and 1.05, this issue (why 1.00 and 1.05 are the main level to see how strong the disposition effect are) will be explained specifically in chapter 3.

Investors in winning IPO's whose have stock with positive initial return but slowly fall close to the offer price might be urged to sell their shares in anticipation and fear of getting loss. This scenario is a modification of the tendency to sell winners early: conditional on not having sold before (Kaustia

Markku, 2004), the investor is predicted to sell before losses begin to accumulate. This increase of selling, because prices fall, should occur slightly above offer price rather than below.

While the stock falls below the offer price, the willingness to sell their sell should be reduced. So, the second dummy variables of winners stock are added on the day that stock price falls until relative to the purchase price especially when the return index on the level 1.05 or 1.10 this issue (why 1.05 and 1.15 are the main level to see how strong the disposition effect are) will be explained specifically in chapter 3.

The research gap is one; the disposition effects is happen on losers and winners or just happen in each one. Thus, there is a need to asses **"The Aggregate Bias of the Disposition Effect: Evidence from IPO Trading Volume of Companies listed on period 2000 – 2010**". Build of that reason, this research tries to analyze presence or absence the disposition effect on aggregate market level by examine the abnormal trading volume.

1.2. Problem Statement and Research Questions

Besides the research gap of two researches before, one is not currently known is the extent of this behavioral bias that many investors share influence aggregate market behavior. This is hard to find because relevant reference price depend, among other things, on purchase price that are unique to each investor. Many investors, on the given situation, have a different purchase price and that's

why disposition effect is hard to measures. Knowledge on which reference price in a given situation are most relevant to investors is far from complete (Kaustia Markku, 2004).

In this research I focus on the disposition effect and look at whether it can be found at the market level. I propose a hypothesis that the disposition effect influence turnover volume. The main problem in verifying this hypothesis in a standard market situation is that investors buy the same shares at different points of time and for a difference price. When making a decision on a day *t* to sell or hold a particular share various investors have different perspectives. Some of them may have their reference point below and others above the reference point, this being their purchase price.

An Initial Public Offering (IPO) is a unique non-standard market situation that offers a remedy for this issue and enables us to search for the disposition effect at the aggregate level. All, or at least most, investors participating in a public offering buy shares at the same purchase price. Therefore on the first trading day those investors have the same reference point. If the return is positive the will be more eager to sell than if they suffer a loss. Changes in supply resulting from the disposition effect at the individual level should be observable at the aggregate level as differences in turnover volume on the first trading day depending on a negative or positive value of the IPO return.

Kaustia Markku (2004) found that the turnover is significantly lower for a negative initial return of IPO's when the share is traded below the offering price and increase on the day the price surpasses the offering price for the first time. His

research concerns US IPO's between 1980 and 1996. Kaustia Markku (2004) also found that the disposition effect happen in losers stock which proved with increasing trading volume when the price crossed the offer price from below.

Another research about disposition effect on IPO trading volume is (Szyszka, Adam and Zielonka, Piotr) shows that a higher turnover volume is associated with a positive initial rate of return and a lower turnover volume associated with a negative initial rate of return. They also found that the disposition effect is happen both in losers stock and in winners stock. This phenomenon can be explained by the disposition effect. Nevertheless Szyszka, Adam and Zielonka, Piotr found the disposition effect both in losers and winners stock, otherwise Kaustia Markku (2004) just found losers stock which strong enough to support the disposition effect.

Based on those problems, research questions that would be studied in this research listed as follows:

1. Does a significant increase in trading volume for negative initial return IPO's (losers) when they exceed the offer price for the first time?
2. Does a significant increase in trading volume for positive initial return IPO's (winners) when they fall relative to the offer price for the first time?
3. Does trading volume is higher on price levels above than below the offer price for a given IPO stock?

1.3. Objective and Research Benefit

1.3.1. Research Objective

1. To analyze a significant increase in trading volume for negative initial return IPO's (losers) when they exceed the offer price for the first time.
2. To analyze a significant increase in trading volume for positive initial return IPO's (winners) as they fall relative to the offer price for the first time.
3. To analyze trading volume on price levels above than below the offer price for a given IPO stock.

1.3.2. Research Benefit

The benefits of this research are:

1. Benefit for academy community

   The results of this study are expected to contribute knowledge about the impact of a behavioral finance; the disposition effect on aggregate market level. Furthermore, results of this research hopefully can add empirical research repository about financial management especially concerning about behavioral.

2. Benefit for traders

   This research is expected to give approximation for traders about Indonesia stock trading behavior, so it could be a reference. This research also can be reference when make a decision of hold, sell, or buy stock because in this research provide some information trading

volume and stock return. So, traders can learn when they have to make a decision for their investment. Also can be learned the result of reference price of this research to make a decisions to buy, sell or hold the stock

3. Benefit for readers

   This research is expected to enhance reader's knowledge and information about how's the behavioral of indonesia investors. A well as reference materials to comparative study in the future regarding the impact of disposition effect on aggregate market level which still comparatively rare compared to other fields in financial management.

1.4. Thesis Outline

Outline of this bachelor thesis is described as follows:

Chapter I Introduction

Chapter I provide the research background about relationship between extreme trading volume and expected return, problem discussion, research questions, research objectives, and research benefits.

Chapter II Literature Review

Chapter II contains underlying theories and reviews of the previous study that has the closer relationship to the subject of this study. It also contains theoretical framework of the study and the hypotheses.

Chapter III Research methodology

Chapter III explains the research methods. This chapter also includes definitions and operational measurements of the variables, population and sampling frames, and data type and source. This chapter also describes analysis method used in this research.

Chapter IV Result and Analysis

Chapter IV presents research objects, data analysis, and discussion of the research hypotheses.

Chapter V Conclusions

Chapter V provides the conclusions and implications drawn from the research. Research limitations and suggestions also included in this chapter.

CHAPTER II

LITERATURE REVIEW

2.1. Theoretical Background

From simple observation of friend, colleagues and maybe ourselves, it is evident that individual investment behavior is often at odds with the assumptions typically made in finance. It is also evident that there are large individual differences in the way investors behave. Recently some effort has been made to find out how behavior differs systematically from the normative models of standard finance theory (Zuchel Heiko, 2001). One of the better documented behavioral patterns emerging from this research is the disposition effect.

The disposition effect describe as tendency to “sell winners too early and ride losers too long” relative to the prescriptions of normative theory (Sherfrin and Statman, 1985) where the “winners” are labeled to those investors who buy a stock at a purchase price then the price increasing so they get a return, and “losers” are labeled who buy a stock then the price fall so they get a loss. That such behavior is relevant for some investors has been documented in some studies.

While the question whether there is a disposition effect (for some investors) arguably has been settled, the question why there is such an effect in the first place has received only little attention. This is unfortunate for at least two

reasons. First, the disposition effect describes sell decisions only and is thus only a partial description of investors' behavior. Understanding the driving factors behind it might help us in understanding other aspects of investor behavior, such as how initial buy decision are made. Also, knowing what drives the disposition effect might help us in determining factors that encourage or discourage it (Zuchel Heiko, 2001). That information may be will useful to help individual investors avoid the disposition effect.

The disposition effect describes the influence of prior performance (winners and losers are treated differently) and prior portfolio decisions (it makes a difference whether a stock is held or not) on current portfolio choice. How can there be such an influence? At the simplest level, standard economic theory implies that investment decisions are driven by expected return, risk, and the trade-off between these two arguments; risk aversion. From this perspective, the disposition effect can arise if any of these factors is affected by whether the asset is a winner or a loser (Zuchel Heiko, 2001).

Two of the extant theories are based on such an argument. Unjustified belief in mean reversion implies that winner's investors expect to lower returns and loser's investors expect higher returns. The value function of prospect theory together with the assumption that investors integrate or "merge" the outcomes of successive investment periods implies that risk aversion depends on prior returns, so that investors can have high risk aversion after gains and low risk aversion after losses (Zuchel Heiko, 2001).

Another possibility to obtain the disposition effect is to posit that investors do not care exclusively about risk and return but also about other things that are in turn affected by prior performance and portfolio choice. This is how the third extant explanation, regret theory, works. According to regret theory, individuals care not only about monetary outcomes but also how these outcomes make them feel about the decision they made; the decision to buy, sell or hold a stock. The disposition effect arises if anticipated regret leads to a preference for selling winners rather than losers (Zuchel Heiko, 2001).

2.1.1. Unjustified Belief in Mean Reversion

The explanation for the disposition effect is based on biased expectation of future return affected by ability of assets' pricing. Investors might choose to sell winners stock and hold losers because they believe that winners will have lower future returns than losers. One reason for such a belief is that investors expect prices to mean revert.

Mean reversion means negative autocorrelation of return: Above average returns in one period imply that the expected value of returns in subsequent periods are below the long-run average. If there is in fact no such mean reversion; the investors falsely believes returns to be negatively auto correlated, such a pattern in return motivates the disposition effect: After high returns, an investors expects lower returns inducing him to sell and after low returns, he expects higher returns inducing him to hold on to the assets or even purchase additional shares.

Hence as was pointed out by (Odean, 1998) and (Weber and Camerer, 1998), an unjustified or irrational belief in mean reversion can cause the disposition effect.

If Individuals investors believe in mean reversion, they will make regressive predictions. The evidence on whether predictions are extrapolative or regressive is mixed. While there seems to be some tendency for individual to make regressive predictions, possibly motivated by a belief in mean reversion, this tendency is fragile. Whether expectations are regressive or extrapolative depends on whether investors focus on price levels (leading to regressive prediction) or price changes (leading to extrapolative predictions). This observation is particularly damaging to the mean-reversion explanation since the disposition effect stresses the importance of prior price changes not levels (Zuchel Heiko, 2001).

Whether investors believe in mean reversion seems to depend on a variety of factors whose relevance in practice is unclear. There is hence only weak empirical support for the hypothesis that belief in mean aversion explains the disposition effect but, conversely, also no strong evidence that investors do not believe in mean reversion. But there is a more fundamental concern about explaining the disposition effect through belief in mean reversion. While belief in mean reversion provides a rationale for the tendency to sell winners and hold losers, it does not explain why this tendency applies only for stocks that are held. Under belief in mean reversion the desire to sell winners and hold losers is completely independent of whether or not the investor already holds the asset or not! (Zuchel Heiko, 2001).

To summarize, belief in mean reversion does not explain the disposition effect unless one makes additional assumptions about why the belief in mean reversion translates into behavior only for those stocks that are in the portfolio. It remains unclear why should consistently overestimate the expected return for losers and underestimate the expected return for winners and there is only weak evidence that they actually do (Zuchel Heiko, 2001).

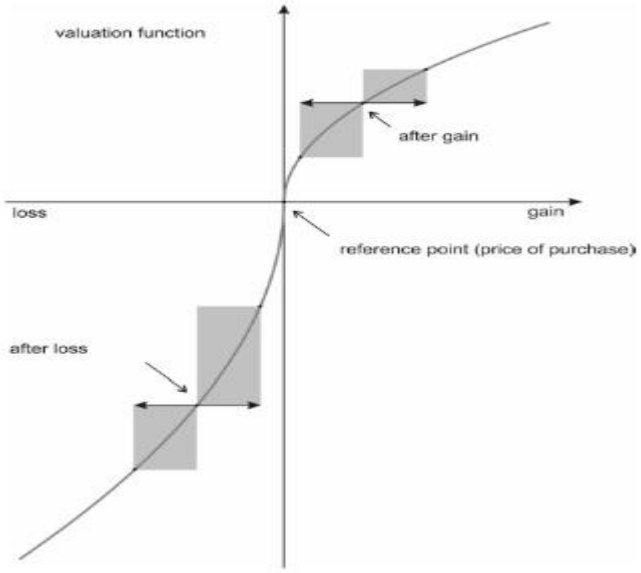
Unjustified belief in mean reversion is of course only one reason why investors might have biased expectations of future returns. Another reason that gets around criticism just discussed is that investors have a strong (and unjustified) belief in their stock picking skills: Suppose an investor believes he can successfully spot mispriced assets in the market. Such an investor would buy assets that he perceives to be undervalued.

He would sell assets where he thinks the undervaluation that made him purchase the asset has been eliminated through a subsequent price rise (a winner asset) or through deterioration of his expectations for the asset. He would, hold on to assets that have not appreciated or even depreciated (losers) because he think the initial undervaluation has not yet been corrected by the market. The disposition effect would thus be a simple consequence of the belief in one's stock picking skills (Zuchel Heiko, 2001).

2.1.2. Prospect Theory

The explanation that prior return changes an investors' preference for bearing risk is her risk aversion (Sherfrin and Statman, 1985), Odean (1998), Weber and Camerer (1998). It is states that risk-aversion increase when investors have made a gain and decrease when loss. Hence, prior gains lower current demand for the asset and prior losses increase it, so that investors might want to sell winners and hold or even escalate their commitment to losers.

Figure 2.1
S-Shape Utility Function Curve



This explanation for the disposition effect is typically based on the prospect theory of (Kahneman and Tversky, 1979) whom observed the reflection effect, the phenomenon of "risk seeking over losses and risk aversion over gains". They formalized this observation through a utility or S-Shaped of Value Function that is defined over gains and losses relative to a reference point and that is concave over gains and convex over losses.

A shares being sold faster after gain than after loss was explained by the S-shaped utility function. After a gain the diminishing curvature of the utility function makes an investor tend to sell a share because the utility of further share price growth is smaller than the utility of further share price drop of the same value.

The reference point turns out to be crucial for the disposition effect. It is states that investors who hold a stock with different reference points, their investment decisions will be different. For an investor who does not hold the stock the reference point for her investment decision is simply the current stock prices (Zuchel Heiko, 2001).

In other hand, investors who hold their stock, their reference point is the initial purchase prices. The idea behind this restriction is that investors, who purchase a stock, open a mental account for that stock and then "keep a running score on this account indicating gains or losses relative to the purchase price" (Shefrin and Statman, 1985).

(Kahneman and Tversky, 1979) attribute the shape of the value function to decreasing sensitivity to monetary stimuli.

> "Many sensory and perceptual dimensions share the property that psychological response is a concave function of the magnitude of physical change. For example, it is easier to discriminate between a change of 3º and a change of 6 º in room temperature, than it is to discriminate between a change

> of 13 º and 16 º. We propose that this principle applies in particular to the evaluation of monetary changes. Thus, the difference in value between a gain of 100 and a gain of 200 appears to be greater than the difference between a gain of 1.100 and a gain of 1.200. Similarly, the difference between a gain of 100 and a gain of 200 appears to be greater than the difference between a gain of 1100 and a gain of 120". (p.278)

This is a psychophysical explanation of risk preference. It proposes that the same psychological properties that underlie the perception of physical stimuli (e.g. temperature) underlie the evaluation of monetary stimuli (gains or losses). Decreasing sensitivity means that large gains do no add much more to overall enjoyment and large losses do not diminish overall enjoyment much more than do small losses. The value function is concave for gains and convex for losses (Zuchel Heiko, 2001). If we translated this explanation to the context of the disposition effect, it is means that investors who hold their losers stock because they are not very sensitive for further losses and sell their winners stock because they are not very sensitive to further gains.

To summarize this explanation, the prospect theory mean that risk-aversion is higher in case of gain than in case of losses, which would imply the disposition effect. When investors hold the losers stock, they seeking risk with keep holding the stock until get a gain. They keep holding the stock because the benchmark of not want to realize their loss is initial purchase price.

The purchase price is to be a benchmark below that investor reluctant to realize their losses. In other hand, when investors hold the winners stock, they will avoid risk with sell the stock early. They do that because they are enough of the return or do not want their stock fall below the purchase price anymore. It is also means that investors regret that their stock prices will not increase anymore and go fall below the purchase price. This will explain in further section about regret theory.

2.1.3. Regret Theory

Regret Aversion is a vital factor which accounts for why it is difficult for investors to identify profit and loss (Tehrani and Gharehkoolchian, 2012). (Sherfrin and Statman, 1985) states forward regret, "an emotional feeling associated with the ex post knowledge that a different past decision would have fared better than the one chosen" (p.781), as one of the factors leading to the disposition effect. They also believe that a sense of regret resulting from loss is stronger than a feeling of pride due to gaining a profit. In another research (Shiller, 1999) argued that "Regret theory may apparently help explain the fact that investors defer the selling of stocks that have gone down in value and accelerate the selling of stock that have gone up in value" (p. 1313).

Since stock holders are responsible for their decisions, sometimes they fell regretful for their previous decision. The marginal value of profit and loss decreases when the number of profits of losses increase meaning that the earlier

profits or losses worth more than subsequent profits or losses (Tehrani and Gharehkoolchian, 2012). Therefore, investors tend to hold losers because they are less sensitive on the next losses. Similarly, they are more willing to sell winner because they are not sensitive on the next earning.

Regret theory is a motivational theory of decision making. Its' basic assumption is that individuals are concern with how the outcome of the decision is going to make them feel about the decision itself (Zuchel Heiko, 2001). Suggested by (Sherfrin and Statman, 1985), regret is sometimes put forward as an explanation for the disposition effect: Investors might feel regret when they realize a loss, and, conversely, feel pride when they realize a paper gain. This is explain that not make a losses, but rather than the realization of losses that bring about regret. Conversely, it is not make a gain, but the realization of gains that brings about pride. In this case, investors might show the disposition effect. They might sell winners to rejoice over their past decision and the might refrain from selling losers to avoid feeling the regret over their initial purchase (Zuchel Heiko, 2001).

2.1.4. Overconfidence

Barber and Odean (2002) states that people overestimate their ability both in perdition and the accuracy of the information provided to them. He also states that individuals have a poor performance in estimating probabilities. He note that people often consider themselves more intelligent than they are in actuality.

WineStein (1980) and Kunda (1980) observed that people anticipate that good things happen more to themselves than to others. Vin Stein (1980) argues that people overrate their ability to do things very well than what actually they afford and this overrates increase when things are under their control. Individual always remember their successes and easily forgetting their failures (Tehrani and Gharehkoolchian, 2012). Overconfidence often leads to taking wrong decisions. It is means that stockholders cannot effectively correct their mistakes, so they cannot make a right decision. From the discussions above, reliance on overconfidence might result in wrong decisions and then can influencing the disposition effect.

2.1.5. The Disposition Effect

The disposition effect was first introduced by Sherfrin and Statman (1985) to describe the dominant tendency of investors to keep loser stocks for a long term but to sell winner stocks too early. They make a model to explain why investors tend to sell winner stocks early and hold losers for a long time period. Sooner or later the, investors expect that the prices will increase to at least the purchase price or more will get a return (losers change to winner). In prospect theory, risk-aversion concern on profit, it makes investors are willing to identify profit. So, they sell quickly share which get a return.

Barber and Odean (2002) use prospect theory to explain the disposition effect. They believe that consider the purchase price as reference point. For instance, if they expected that price of given stock will rise in future; they will buy

it and make the price as a reference point. In case of stock price increase, they identify the profit and soon selling the stock. On the other hand, if the stocks are fall below the purchase price, they tries to convince their selves that the price will arise sooner or later, therefore, they keep the losers stock.

The disposition effect is a market anomaly that has challenged the soundness of the rational agent assumption (Wang Zhongkul, 2011). In another research, Sherfrin and Statman (1985), Odean (1998), and Grinblatt and Keloharju (2001) shows that investors demonstrate strong behavior for realizing winning positions sooner than losing position.

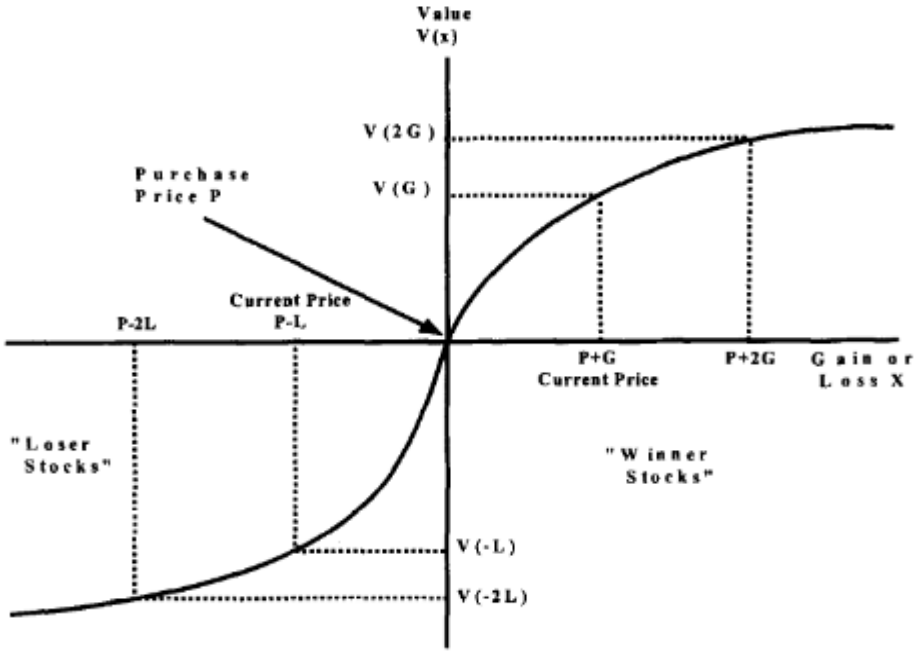
On their research (Weber and Camerer, 1998) show how reflection effects and reference point effects can combine to cause the disposition effect. They suppose an investor buys a share of stock for price *P*. Subsequently the stock falls in value by the amount L, to a price of P – L, (they call this a losers stock). The investors can sell the stock or hold it. If they decide to hold the stock, its might be return to the purchase price or fall by *L* for twice to a price *P-L-L=P-2L*. Conversely, in the winners stock, assumed the stock rises by the amount of *F*, to price of *P+G*. In other hand if investors hold the stock, its might fall back to purchase price or rise by G again to *P+2G*.

Based on the (Weber and Camerer, 1998) research, figure below represented what happens when investors' reference point is the original purchase price *P*. Prospect theory said that people value gains and losses from the reference

point and they will risk-seeking in domain of losses and risk-averse in gain, so a losers stock with value *P-L* if it sold, and either *P* or *P-2L* if it is held.

If the reference point is P, investors' investment decision in certain loss is two: sell the stock with consequence of gaining loss *v(-L)* or keeping stock with take a gamble that stock will be breaking even *v(0)* or more loss at *v(-2L).* If they risk-seeking in the domain of losses, they will keep the stock. Investors will keep losers because $P-2L < P$ (the pain of further loss L is less than the pleasure of recovering the purchase price (Weber and Camerer, 1998)).

A winner stock with value *P+G* if it sold, and either *P* or *P+2G* if it is held. If the investors are risk-averse to be gambles, the will sell the stock in certain gain G with value v(G) rather than choose gambling on get a gain v(2G) with possibility of breakeven v(0). Investors will sell winners.



In case of the disposition effect, Zhongkul Wang (2011) also examines the holding time difference between losing positions and winning positions. His opinion is that; in multi-period investments, the probability that investors can achieve positive returns on their positions evolves with the length of the holding periods of their buy-and-hold positions, and such evolution possibly misleads researchers to the conclusion of the disposition effects. Intuitively, for some stocks, the longer the holding period is, the more likely it is that the investor suffers a loss. If such stocks dominate the market, the holding period of winning positions is shorter than that of losing positions.

The winning probability dynamics is a theoretical foundation of Zongkul Wang's (2011) evidence, Wang investigate the winning probability of investors. In a standard theoretical model of multi-period investment can distributed return series. The winning probability refers to the cumulative probability that investors

can achieve a positive return on their investment positions. Of course the winning probability provide some information about the return process; volatility, skewness, and mean return. Intuitively, the smaller the mean return, the larger the volatility and more positive the skewness are, the more likely the investors will suffer losses.

The winning probability dynamics depends on the sign of $(\frac{\mu}{\sigma} - \frac{\sigma}{2})$, where μ is the mean and σ is the volatility of one-period return. For stocks with negative $(\frac{\mu}{\sigma} - \frac{\sigma}{2})$ return, the longer investors hold them, the higher the probability is that the investors may suffer losses on them.

Winning probability dynamics predicts that the disposition effect can be observed even when investors do not suffer behavioral bias (Wang Zhongkul, 2011). If stocks with negative $(\frac{\mu}{\sigma} - \frac{\sigma}{2})$, next we called it ***w***, dominate the market, the longer the holding time is associated with the higher the probability that the investors suffer a losses. It is means that holding time of winning positions is shorter than that of losing position.

Heisler (1994), Locke and Mann (2005), Shapira and Venezia (2001) states that the average holding time of winning position is significantly shorter than that of losing positions, and it is mean that these observation is driven by the behavioral bias that investors are reluctant to sell their losing positions. Schlarbaum et all (1978) also states that holding time of winner positions (positive return) is shorter than that of loser position (negative return); this phenomenon is associated that investors are reluctant to realize their losing position.

Wang Zhongkul (2011) research states that for stock with negative ***w,*** the average holding time of loser positions is 387 days whereas the holding time of winner positions is 285 days. In other hand, stock with positive ***w,*** the average holding time of loser positions is 347 days, 94 days shorter than the holding time of winner positions.

The conclusion is winning probability dynamics mechanically generates the holding time difference, leading to the observation of the disposition effect. The simulation of Wang Zhongkul (2011) show that, for stocks with negative ***w***, the average holding time of winner position is significantly shorter than that of loser positions.

2.1.6. Trading Volume

Trading volume is the number of stocks traded by issuers at stock market through broker and trader. Trading volume is an important matter to investor because stock trading volume portrays the conditions of stocks traded at capital market. Handa and Schwartz (1996) said that the most important thing to notice before decide an investment is its liquidity. Trading volume determined by dividing the number stocks traded at certain period with the number of listed stocks (Jogiyanto, 1998). Trading volume reflects the power of supply and demand which also reflects the manifestation of investor behavior. Ang (1997) stated that the increasing trading volume implies to the increased market power and vice versa.

Suad Husnan (1998) said that trading volume in extreme state counted as a sign that the market will improve or bullish. Bullish indicates the condition where market player shows their confidence and expectations that the strong results will continue. The increasing trading volume and stock price strengthen the indication of bullish in the market. In the other side, when market player confidence that the trend will down, or weak result will continue, it's called bearish.

Other researches also have documented a contemporaneous relation between trading volume and stock return. Active stocks usually have high trading volume and so the subsequent return is also high, said Chordia and Swaminathan (2000). They found that trading volume is a significant determinant of the lead-lag patterns observed in stock returns. Returns of portfolios containing high trading volume is on lead compared to portfolios with low trading volume stocks. The cause of the lag on low volume portfolios is because low volume trading portfolios tends to act sluggishly to new information.

Meanwhile Chen (2001) found that trading volume has positive and significant relationship with stock return when on the other side Cheng et al (2001) found that trading volume has negative and insignificant to stock return.

Currently there is no generally accepted method for measuring abnormal trading volume. Follows to most recent studies (Smith Bamber et. al, 1991; Jogiyanto, 1998; Chordia and Swaminathan, 2000), turnover (number of shares traded divided by number of shares outstanding) can be used for measuring trading volume. Karpoff (1987) found strong support to the existence of a positive

correlation between absolute return and volume in daily data. Karpoff said that the price-volume relation could be asymmetric, in that a large positive price movement generates more trading than a negative movement of corresponding magnitude.

Gallant et al. (1992) found complex nonlinear interactions between prices and volume in their research of bot lagged and contemporaneous effect. They also found a positive relation between volatility and volume. Hiemstra and Jones (1994) find evidence of significant nonlinear Granger causality between daily returns and volume.

2.1.7. Stock Return

Ang 1997 definition about return is the rate of profit that gained by the investor from its investment. Investor motivated to invest their money with expectation to gain a proper return. Without guarantee to gain return, investor will reluctant to invest. Ang also said that return has been an investor prime motive despite the type of the investment, whether it's a long term or short term investment. Return formulated as below:

$$Return = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Where:

P_t = Stock price at period t

P_{t-1} = Stock price at previous period

Return components divided into two kinds, which is current income and capital gain. Current income is profit gained from periodic payment like deposit interest, bond interest, dividend, etc. It called ‘current’ because the profit usually paid as cash so it can be redeemed quickly. Interest coupon bonds paid as check or gyro and cash dividend for example. Another profit equivalent to cash is bonus stock and stock dividend, which are can be converted to cash by selling the stock attained.

Capital gain is profit from selling and buying price difference. For example if investors buy a share at price 1.000, then they sell when the price at level 1.200, the capital gain that investors get is 200. Capital gain very dependent to market price of the instrument in question, which means the instrument, should be traded in the market. Prices change can be associated with trading activities. The changes enlarge the possibilities for the investors to gain bigger profit. Conversely, if there is lack of trading activities, the stock price will tend to be stagnant. This stagnancy may not appeal investor who trade for seeking profit just through sell and buy activity (Nugraheni Novita, 2013).

On his research, Eduardus Tandelilin (2001) states that return differentiated to realize return and expected return. Realized return is a return that has been calculated based on historical data. Realized return is important because it used to measure the performance of the stock or the company as well as the base to determining expected return to measure risk in the future.

Expected return is the return investor can be expected in the future. Unlike realized return, expected return is not yet happened. Expected return in the future is a compensation for time and risk sacrificed for the investment. Eduardus Tandelilin also said that return is a factor that can motivates investor to interact and also a reward for the investor bravery to take the risk of their investment.

Suad Husnan (1998) mentioned that expected return is an income to be received by investors on their investment in the issuer company in the future and the profitability is strongly affected by the company's prospect in the future. An investor will expect a certain return in the future, if the investors already achieve it so the return became realized return.

Nugraheni Novita (2013) said that to maximize the return of the investment, investor emanates strategies to maximize expected return at various risk levels. One of the strategies is by investing stocks into portfolios. Portfolios defined as a set in which investor can investing various types of investments to reduce risks. Rational investor will choose to invest at the most efficient portfolio. Efficient portfolio as defined by Jogiyanto (2000) is either portfolio which give biggest expected return at certain risk level or portfolio which give smallest risk at certain expected return.

If investors are holding a stock, in case of the disposition effect, return can influences the decision of investors whether they have to hold the stock or sell it. Based on the prospect theory which says that investors are risk-seeking in the domain of losses and risk-averse in the domain of gain, if the stock return is

negative, investors tend to hold the stock because of reluctance to realize their losses. Conversely, if investors in the domain of gain, they tend to be risk-averse and sell their profitable stock quickly.

Stock return also influences the decision of investors, especially when the stock with negative return crossed the purchase price from below to be positive return. Positive return can influence the investors' decision to sell their stock so they get a gain especially to investors who hold the negative stock return in a long period. This is also can be motivated by regret theory that investors fear if their stock falls to the purchase price anymore so they became 'losers' twice.

2.1.8. Volume-Return Theory

This research uses the following contradicting theories as its theoretical backgrounds. Thus, the result can be compared between the theories to determine which one is more suitable for the nature of this research. The theories are as follows:

2.1.8.1. Behavioral Hypothesis

Behavioral Hypothesis was proposed by Lee and Swaminathan (2000). Lee and Swaminathan document some empirical evidence that trading volume or changes in volume reflect fluctuating investor sentiment. The hypothesis gave evidence that the information content of trading volume is related to market misperceptions of firms' future earnings prospects. Specifically, it provide strong

evidence that low (high) volume stocks tend to be under- (over-) valued by the market.

This evidence includes past operating and market performance, current valuation multiples and operating performance, and future operating performance and earnings surprises. Investors' sentiment after acquire the information most likely affect their decision or point of view towards the stocks. One implication of the finding is that investor expectations affect not only a stock's returns but also its trading activity. The investor irrationality-induced volume–return relation is referred to as the behavioral hypothesis.

2.1.8.2. High-volume Return Premium

High-volume return premium was proposed by Gervais et al. (2001). This theory shows that periods in which individual stocks experience extreme trading volume, relative to their usual trading volume, contain important information about subsequent stock returns. Specifically, periods of extremely high volume tend to be followed by positive excess returns, whereas periods of extremely low volume tend to be followed by negative excess returns. This effect holds when the formation period for identifying extreme trading volume is a day or a week. It also holds consistently across all stock sizes.

This high-volume return premium constant with Miller (1977) founding. Miller stated that an increase in a stock's visibility will tend to be followed by a rise in its price. This prediction is highly consistent with the high-volume return

premium, as visibility and demand shifts seem to be prompted by trading volume shocks. The plausibility of this explanation is reinforced by two findings: (1) the returns on the day/week of the volume shocks do not seem to affect the existence of the high-volume return premium; (2) past losers, which have arguably fallen out of investors' interest, tend to be particularly affected by shocks in their trading activity.

In general, this theory stated than when one stocks experiencing extremely high (low) trading volume, the changes will attract investor attention. The high volume will affect investor that the stock is highly sought by market and attracts them to trade on the said stocks. The act will lead to the increase in subsequent return. In the contrary, the stocks which experience low volume will fall out of investors' interest which leads to the decrease in subsequent returns. High-volume return premium believe that extreme trading volume has positive relationship with expected returns

2.2. Previous Research

Researches on The Disposition Effect in IPO Trading Volume have been done by some of the researchers, as follows:

1. Kaustia Markku (2004)

   This research examines the market-wide impact of the disposition effect; evidence from IPO trading volume. He studied

empirically the market-wide importance of investors' reluctance to realize their losses by investigating IPO trading volume. Kaustia give an opinion that in IPO all initial investors have a common purchase price, so the disposition effect should be at its strongest because in no other situation in the stock market is there as clear a setting to investigate the disposition effect in aggregate. He investigates the importance of different reference price for the stock market as an aggregate by examining IPO trading volume.

Their contribution of his paper is two; first, he performs a 'first order' test for the market implication of the disposition effect. Trading volume should be higher when the stock is trading above the offer price vs. trading below the offer price. Second, provides additional evidence on the determination of reference price.

The IPO data collected from The Securities Data Corporation (SDC) database. All U.S. IPO between January 1, 1980 till December 31, 1996 where data on offer date, offer price, gross proceeds, and number share outstanding are matched with Center for Research in Security Price (CRSP) 1997 daily files. From SDC database he collected of 7.138 IPO, then he excluded firm for some reason; 1.254 firm because the initial trading date in CRSP more than 10 days after IPO date in SDC.

Excluded 421 firm with gross proceeds $3 million or less or offer price $1 or less per-share. Then 60 firm with less than one year (254 trading days) of data. Last, 321 firm with more than 15 days of missing volume. Total leaves a base sample of 5.082 IPO with maximum of two years (508 trading days) of stock return and volume data.

The sample characteristic of data are; base sample (*N*= 5.082), 15% of *N* (775) have a negative initial return and labeled 'losers'. Then 68% of the firm (3.444) have a positive initial return and called 'winners'. The residue, 17% of total firm (863) has a zero initial return. For the study of reference price, he selected subsamples from the losers and winner samples.

He take all loser firms whose stock prices crosses the offer price from below for the first time after four weeks (>20 trading days) of issues' date. A total 342 firms meet this condition and are include in subsample losers. Conversely, for winners, he takes all firms whose stock prices crosses the offer price from above for the first time after four weeks. This gives 1.712 subsample winners.

On his research, he offers 4 hypotheses. First, trading volume have a positive correlation on price levels above the offer price for a given IPO stocks (H_1). Second, there is positive correlation of an increase in trading volume for negative initial

returns of IPOs' as they exceed the offer price for the first time (H_2).

Third, there is a positive correlation of an increase in trading volume for positive initial return of IPOs' as the fall below the offer price for the first time (H_3). Fourth, there is a positive correlation of an increase in trading volume for IPOs' as their stock prices reach a new record highs or lows (H_4). The second and third hypotheses are nested in the fourth one, as the event of exceeding (falling below) the offer price for the first time is also always a new all-time high (low).

For the methodology, he uses a two-step procedure for estimating the behavior of turnover for two subsamples. First, he estimates a model of normal turnover for each firm separately. Then, he runs a pooled OLS regression on the first step residuals to determine the magnitude of behavioral effects.

The variables uses in the firm regression (step one) are: first, *Volume variables*; Market turnover, Turnover, Turnover (-n). Second: *Seasoning Variable*s; Time and Time^2. Third: *Stock Return variables*; Return, Max(R,0), -Min(R,0), Volatility, R*(-n)*, R*(-5)*, R*(-3)*. Then, a pooled regression (step two) with the step one residuals as the dependent variable runs for determining the magnitude of behavioral effect. The dummy variable are: HI1M,

LO1M, 1st CROSS XB, 1st CROSS XA, CROSS 1st,....,Nth *x* B (or A). CROSS 2nd,...,Nth *x* B (or A), RANGE (X_1, X_2).

The results show significant for market turnover for over 50% of the firm. The relation between contemporaneous turnover and stock return is quite strong. Lagged returns do not appear significant for most firms. The coefficient of volatility also does not appear consistent, since coefficient negative for losers but positive for winners. The seasoning variable does not appear significant too.

The market volume variable are significant at average 2.31 for losers and 2.71 for winners with median 2.28 for losers and 2.61 for winners. The contemporaneous turnover; Volume (-1) and Volume (-2) is significant at average 4.40 and 2.16 for losers and 4.61 and 2.13 for winners. The Seasoning variables are not significant; -0.34 for Time and 0.25 for $Time^2$. Maximum and Minimum return; *MAX*(R,0) and –*MIN*(R,0) significant in average at 3.00 and 2.04 for losers and 2.87 and 2.12 for winners. Volatility do not appear significant; coefficient -0.40 for losers and -0.18 for winners. Lagged return do not appear significant; *R*(-1), *R*(-2), and *R*(-5) coefficient <1,96.

The next result of step two regressions also indicates the disposition effect. The volume is clearly lower when the stock is

trading below the offer price. The price range dummies are almost all negative below the offer price and highly significant through the range 0.75 – 1.00. Crossing the levels 1.00 and 1.05 from below for the first time shows a significantly higher turnover (with *t-values* of 2.8 and 3.4).

The summary of results shows the disposition effect on losers stock but for winners IPOs' do not offer clear support for the disposition effect. Kaustia suggest to further empirical research is needed for uncovering the potential effects of reference points on asset return, in addition to volume studied here. These studies can shed more light on whether asset pricing models that incorporate loss aversion and reference prices are likely to be successful.

2. Szyszka, Adam and Zielonka, Piotr.

This research examine whether the disposition effect can be found at the aggregate market level. They propose hypothesis that the disposition effect influence turnover volume. They use a unique non-standard market situation, which is IPOs', because all, or at least most, investors participating in a public offering by shares at the same purchase price. They conduct their research on a vibrant emerging market in Poland, The Warsaw Stock Exchange. Their hypothesis was that similarly with (Kaustia, Markku 2004) that

turnover volume is higher on the time stock traded above offer price *vs*. below offer price.

The sample used on this research consisted of 32 IPOs' that occurred on The Warsaw Stock Exchange (WSE) from the beginning of 2000 till the end of 2005. From the total number of 36 IPOs' that happened during that period on the WSE. They calculated each IPOs' into two types of returns:

- A nominal initial rate of return calculated as:

  R absolute : $\ln\left(\frac{P_1}{P_{IPO}}\right)$ **[1]**

- A market-adjusted initial rate of return calculate as:

  R adusted : $\ln\left(\frac{P_1}{P_{IPO}}\right) - \ln\left(\frac{WIG_1}{WIG_{IPO}}\right)$ **[2]**

  Where:

  P_1 is the closing price at the first day of listing.

  P_{ipo} is the IPOs' offer price.

  WIG_{ipo} is the closing level of the WIG Index on the last day of the IPO.

WIG_1 is the closing level of WIG index at the date of the first listing.

Employing both nominal and market-adjusted initial rates of return allows to verify if investors pay more attention to pure profits and losses or if the put the returns in the context of market performance in the period of time between the IPO and the first listing. Then, for calculated the measures of the relative volume, they use formulas as follows:

$$RV_1 = \frac{V_1}{V_{total}}, \qquad [3]$$

$$RV_2 = \frac{V_1}{V_{IPO}}, \qquad [4]$$

$$RV_1 = \frac{V_1}{V_{average}}, \qquad [5]$$

Where :

V_1 is the number of shared traded on the first day of listing

V_{total} is the total number of shares admitted for public trading on the market.

V_{ipo} is the number of shares offered in a public offer.

$V_{average}$ is the number of shares per trading day traded between 31st – 270 th.

RV_1 measures what percentage of all shares admitted to the market, including those offered publicly and those distributed privately, was traded on the first trading day. RV_2 shows what part of the shares offered in IPO changed owners on the first trading day. RV_3 measures volume on the first trading day in comparison to the normal volume, defined as the number of shares of a particular company traded on average between $31^{st} – 270^{th}$.

They divided the sample of IPOs' into two groups: 'winners – shares that generated positive return between the first listing and the IPOs' offer, and 'losers' – shares that made negative return on their debut. They excluded cases with zero return. They tested the significance of the difference between averages for 'winners' and 'losers' with U Mann-Whitney test.

The result shows that U Mann-Whitney test showed a statistically significant positive difference between the turnover volume of positive initial rate of return shares and negative initial rate of return share for all turnover measures: RV_1 ($p<0.001$, $U=11$, $Z=3,51$), RV_2 ($p<0,01$, $U=17$, $Z=-3,20$), RV_3 ($p<0,001$, $U=15$, $Z=-3,31$).

In the second step the nominal rate of return of IPOs' was replaced by a market adjusted one. The result also indicated that the turnover volume of positive initial market-adjusted rate of

return shares is significantly higher than of the negative initial market-adjusted rate of return RV_1 ($p<0.05$, U=43, Z=-2,54), RV_2 ($p<0,01$, U=35, Z=-2,88), RV_3 ($p<0,001$, U=37, Z=-2,88).

The conclusion, Szyszka, Adam and Zielonka, Piotr research found both the nominal and market-adjusted rates of return the turnover volume turns out to be significantly higher for winners and losers. This is also in accordance with the previous research by Kaustia, Markku (2004). They presume that this observation is due to the disposition effet exhibited by individual investors. The present research offers such a link between the individuals' disposition effect and the aggregated volume turnover in the specific conditions of IPOs'.

Table 2.1
Summary of Previous Researches

Researchers	Title	Variables	Analysis Method	Results
Kaustia, Markku (2004)	Market-Wide impact of the disposition effect: Evidence from IPO trading volume	Market turnover, Turnover, Turnover (*-n).* Time, $Time^2$, Return, MAX(R,0), -MIN(R,0), Volatility, R*(-n),* R*(-5),* R*(-3),* residual of step one	Regression for step one, Pooled Regression for step two.	The results show significant for market turnover for over 50% of the firm. The relation between contemporaneous turnover and stock return is quite strong. Lagged returns do not appear significant for most firms. The

		regression, HI1M, LO1M, 1st CROSS *X*B, 1st CROSS *X*A, CROSS 1st,...,*N*th *x* B (or A), CROSS 2nd,...,*N*th *x* B (or A), RANGE [X_1,X_2[, HI1M x I(R>5%), LO1M x I (R<-5%).		coefficient of volatility also does not appear consistent, since coefficient negative for losers but positive for winners. The seasoning variable does not appear significant too. The next result of step two regressions also indicates the disposition effect. The volume is clearly lower when the stock is trading below the offer price. The price range dummies are almost all negative below the offer price. The summary of results shows the disposition effect on losers stock but for winners IPOs' do not offer clear support for the disposition effect.
Szyszka, Adam and Zielonka, Piotr	The disposition effect demonstrated on IPO trading	Nominal initial rate of return, Market-adjusted inital rate of	U Mann – Whitney Test	The result shows that U Mann-Whitney test showed a statistically significant

	volume	return, $RV_{1,}$ RV_{2} , $RV_{3.}$		positive difference between the turnover volume of positive initial rate of return shares and negative initial rate of return share for all turnover measures. In the second step the nominal rate of return of IPOs' was replaced by a market adjusted one. The result also indicated that the turnover volume of positive initial market-adjusted rate of return shares is significantly higher than of the negative initial market-adjusted rate of return. The conclusion, Szyszka, Adam and Zielonka, Piotr research found both the nominal and market-adjusted rates of return the turnover volume turns out to be significantly higher for

				winners and losers. This is also in accordance with the previous research by Kaustia, Markku (2004). They presume that this observation is due to the disposition effet exhibited by individual investors.

2.3. Research's Model and Hypothesis

This research aims to examine whether the disposition effect can be found at aggregate market level with volume and return variable as focus in detecting the disposition effect. The volume variable include, turnover and turnover *(-n)*, the stock return variable include return, maximum return, minimum return, volatility, and return *(-n).* The author formulates the discussed problem as well as limits the scope so that this discussion can be more focused. This study will also present the research model along with appropriate analytical methods in order to achieve the purpose of the research. After that, author will collect the necessary data and process it with the appointed research model, analysis, and statistical methods. Conclusions of the research will be drawn from the processes.

The data required in this study consist of; first step, the factors that influence the trading volume (turnover) in Indonesia Stock Exchange (BEI). The factor that affect trading volume turnover including lagged turnover as a turnover variables. Return, maximum and minimum return, volatility, lagged return as a return variables. Second step, the data required consist of; turnover of each firm in the given range, the stock return index that cross the offer price for the first time from below, stock return index that cross the offer price for the first time from above, both event between 21 – 508 trading days.

1. Measuring Abnormal Trading Volume

Currently there is no generally accepted method for measuring abnormal trading volume. Similarly with recent studies (Kaustia Markku, 2004; Smith Bamber et al. 1999, Chordia and Swaminathan, 2000), I use turnover (number of shares traded divided by the number of shares outstanding) as a measure of volume. I get the daily number of shares traded from ISMD and the number of shares outstanding from IDX, for each firm.

In the (step one) regression model, i define what kind of factors influence trading volume. I use two factors to determine the abnormal trading volume; volume variables and return variables as independent variables. The dependent variables is daily turnover for each firm separately; losers and winners firm.

In the previous research, Kaustia Markku (2004) use of an adjustment for market-wide trading volume when calculating abnormal turnover for individual firm as result founded by Tkac (1999) that market volume influence the turnover. I include market turnover variable as follows. Similarly with firms' turnover, market turnover calculate by the aggregate number of shares traded divided by the aggregate number of shares outstanding.

Several studies have found a contemporaneous relation between trading volume and stock return. Hiemstra and Jones (1994) testing for linear and nonlinear granger causality in the stock price-volume relation and found evidence of significant bidirectional nonlinear Granger causality between stock returns and trading volume. Kaustia Marrku (2004) said that the discovery of Hiemstra and Jones (1994) shows that the causality is bi-directional and robust over all, up to eight, lag lengths considered.

Gallant et al. (1992) find complex nonlinear interactions between prices and volume in both lagged and contemporaneous effect, suggest that large price changes lead to increases in both the mean and variability of the volume. They also examine the relationship that lagged volume has on current price changes and volatility; abnormally high and low volumes are associated with slightly increased future price volatility. They suggested that movements in lagged volume, coupled with a similar movement in lagged price and increases in volatility.

More detail, the daily trading volume is positively and nonlinearly related to the magnitude of the daily price change. The finding of an unconditional volume-volatility relationship is consistent with many other studies [Tauchen and Pitts (1983), Karpoff (1987)]. Lamoreux and Lastrapes (1991) also find a positive conditional volume-volatility relationship in their models. They found that large price movement associated with higher subsequent volume; price changes lead to volume movements.

Studies by Epps (1976), Harris (1986), Morgan (1976), Rogalski (1978), and Smirlock and Starks (1985) imply a positive correlation between trading volume and the price change. Jenning et al (1981) are able to show that in many chase, when a previously uninformed traded interprets the new information pessimistically; the trading volume that results is less than when the trader is an optimist. Since price decrease with a pessimist and increase with an optimist, Chen et al. argues that trading volume is relatively high when the price increase and low the price decrease.

Motivated by the result of the above studies, I include market volume, lagged volume (-1) and (-2), return; positive and negative return separately, volatility (squared return) and lagged return (-1), (-2), (-5,-3). Finnaly as in Smith Bamber et al. (1999) and Kaustia Markku (2004), I apply a log-transformation on all volume variables because of positive skewness of the turnover ratios.

2. Capturing the Disposition Effect

In the step two I run a pooled OLS regression with m_2 explanatory variables. The individual error terms (**e**) from step one are stacked to form the dependent variables. The independent variables include; *First*, dummy variables inside the given price range. *Second*, the dummy variable of losers firm on the time when stock return index crossed the given level relative to offer price from below for the first time. *Third*, the dummy variables of winners firm on the time when stock return index crossed the given level relative to offer price from below for the first time.

a.) Price range and the disposition effect.

Prospect Theory states that risk-aversion increase when investors have made a gain and decrease when loss. Hence, prior gains lower current demand for the asset and prior losses increase it, so that investors might want to sell winners and hold or even escalate their commitment to losers. This explanation for the disposition effect is typically based on the prospect theory of (Kahneman and Tversky, 1979) which found the phenomenon of "risk seeking over losses and risk aversion over gains".

The reference point turns out to be crucial for the disposition effect. It is states that investors who hold a stock with different reference points, their investment decisions will be

different. If we translated this explanation to the context of the disposition effect, it is means that investors who hold their losers stock because they are not very sensitive for further losses and sell their winners stock because they are not very sensitive to further gains.

Regret Theory believe that a sense of regret resulting from loss is stronger than a feeling of pride due to gaining a profit. In another research (Shiller, 1999) argued that "Regret theory may apparently help explain the fact that investors defer the selling of stocks that have gone down in value and accelerate the selling of stock that have gone up in value" (p. 1313). Suggested by (Sherfrin and Statman, 1985), regret is sometimes put forward as an explanation for the disposition effect: Investors might feel regret when they realize a loss, and, conversely, feel pride when they realize a paper gain.

Ferris et al. (1998) find that trading volume that occurs' when a stock is trading in a particular price range is an important determinant of future trading volume. They shows their findings as supporting the disposition effect. Grinblatt and Han (2002) find that stock with large aggregate unrealized capital gains perform better than those with large unrealized capital losses. Kaustia Marrku (2004) offers further support for the aggregate impact of the disposition effect. There is a k ink at the offer price in the price-

volume relation for negative initial return IPOs' so that volume is clearly suppressed below the offer price. Shefrin and Statman (1985) consider the purchase price to be benchmark below which investors are reluctant to realize losses, so that's why investors tend to hold when stock in the domain of loss.

Based on the discussion above, that explains the investors' phenomenon of risk-seeking in the domain of losses, risk-averse in the domain of gain, the regret of investors to realize their losses and the pride to realize their gain. The market implications of the disposition effect should be seen; trading volume should be higher when the stock is trading above the offer price vs. trading below the offer price, if investors are reluctant, regret and risk-seeking to trade lossmaking shares.

b.) Loser Stock and the Disposition Effect

Regret theory concern about the fear of investors to realize their loss. This theory may apparently help to explain the fact that investors defer the selling of stocks that have gone down in value and accelerate the selling of stock that have gone up in value; in the domain of loss investors tend to hold the stock because of their regret of loss and if the stock exceed the purchase price, investors accelerate the selling stock to get a gain beside their reluctance to realize loss anymore. Similarly, they are more willing to sell

winner because they are not sensitive on the next earning and risk-averse in the domain of gain.

Therefore, the immediate effect should be seen when the market price of an IPO with a negative initial return (losers) exceed the offer price for the first time. Kaustia Marrku (2004) said that if the disposition effect is significant enough to affect asset pricing, it should show up in trading volume. Conversely, if the disposition effect is not an important determinant of trading volume, its asset pricing implications is probably not significant.

Kaustia Markku (2004) said that the disposition effect postulates that investors tend to hold on to losing investment and to sell winners. If this behavioral bias is strong enough for a large enough group of IPO investors, one should observe depressed trading volume below the offer price, and an increase in volume when the aftermarket price crossed the offer price from below.

This explanation because disposition-effect-prone investors who are “in the black area” tend to delay their decisions to sell their shares until they get out of the black area and realized a gain. This effect should be seen when a stock with negative initial return of IPO crosses the offer price from below for the first time. Turnover should increase at the time the stock exceed the offer price for the first time.

c.) Winner Stock and the Disposition Effect

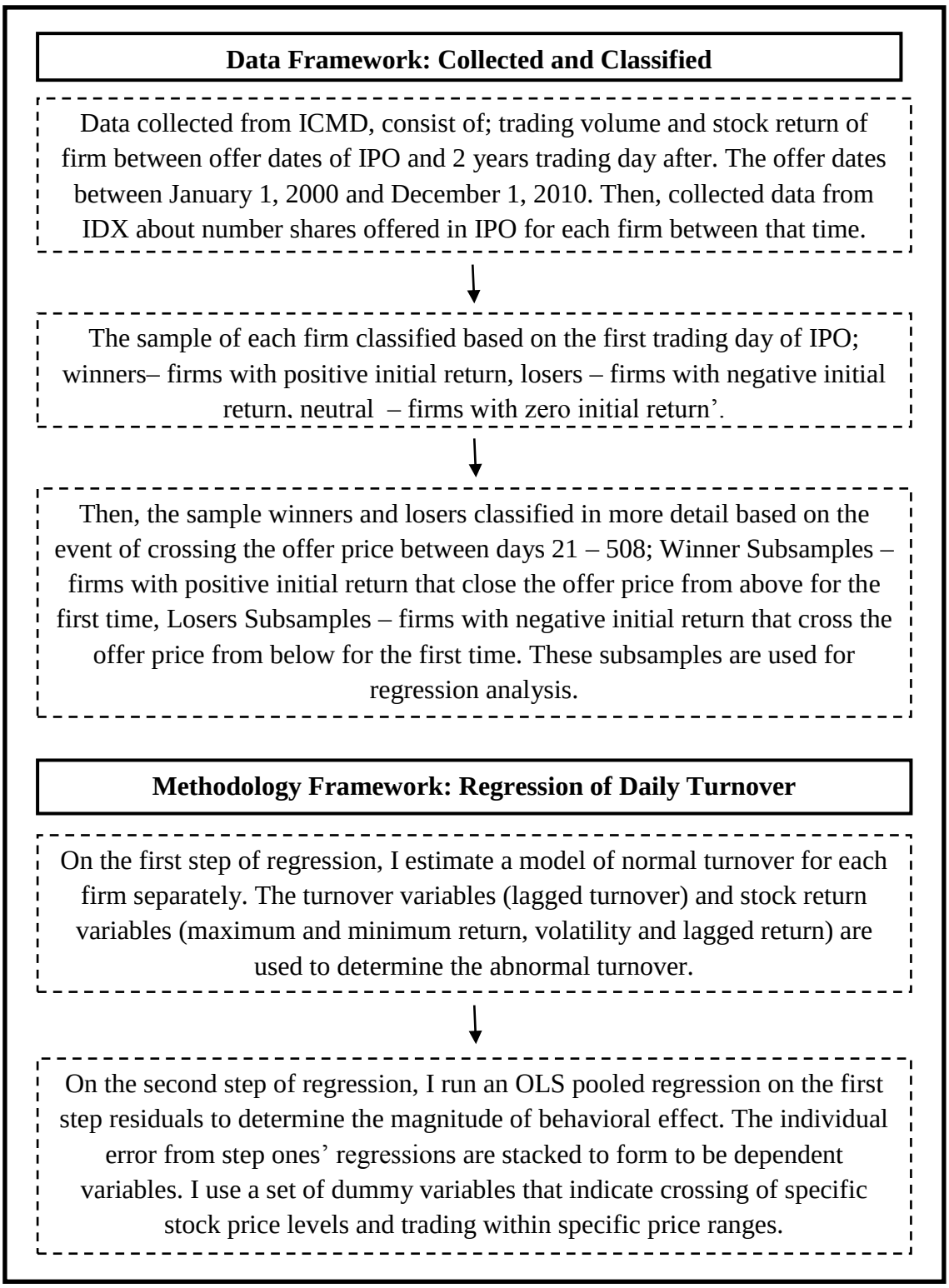
Once again, regret theory explain the fear of investors to realize their loss. This theory should also explain the disposition effect in winners stock. Investors in winning IPOs' whose price initially positive but subsequently decrease close to the offer price might be urged to sell their shares in anticipation and fear of losses. This scenario related with principle of the disposition effect; holding losers to long and holding winner to short/early, the investors is predicted to sell their shares before start to having loss.

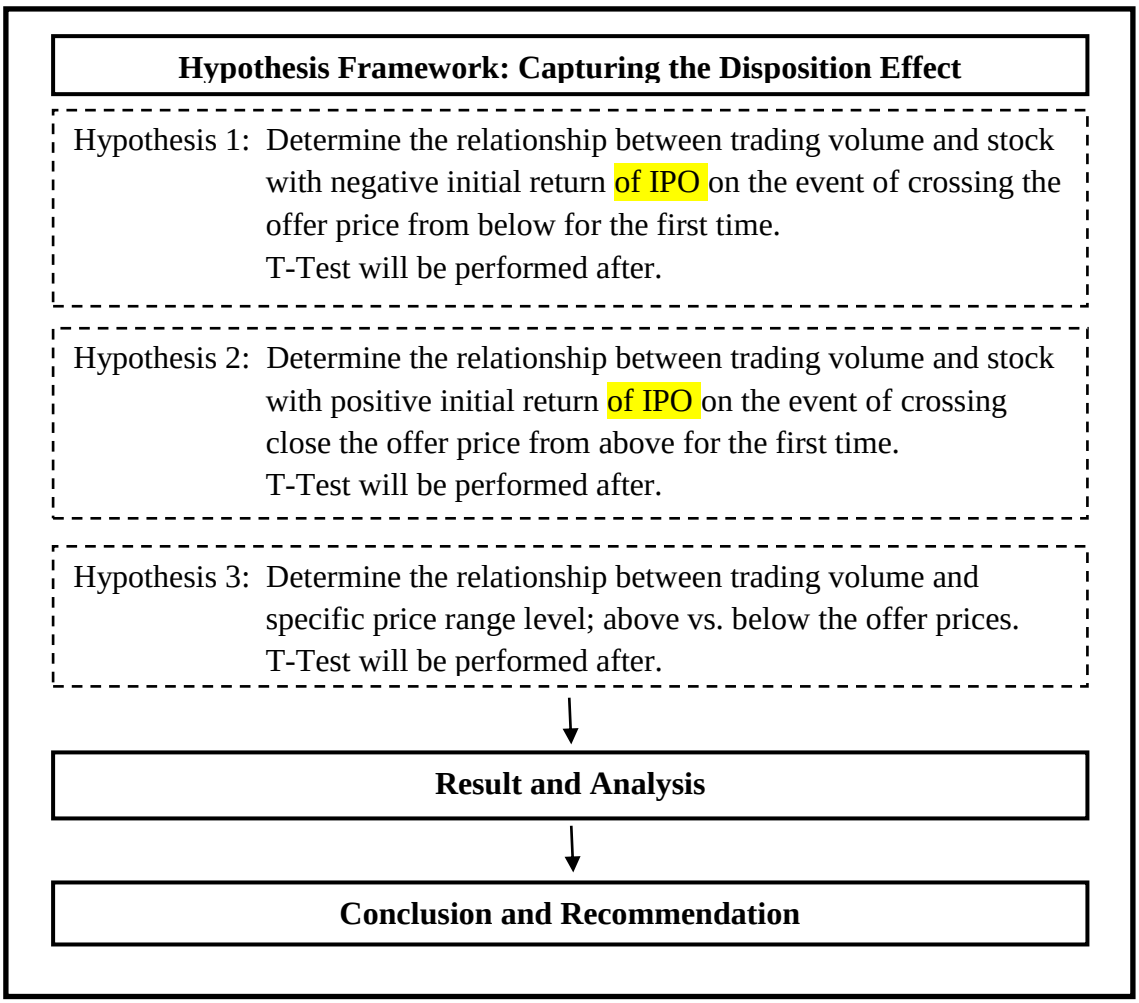
Kaustia Markku (2004) said that this scenario of increase selling because of prices' falls should occur slightly above rather than below the offer price because once if investors decline to sell their shares and the stock falls below the offer prices, the willingness to sell should be diminish. He also said that on the day the stock falls below the offer price, the urge to avoid future losses and the reluctance to realize losses can compete. Their relative strength could depend on the development of market quotes and price during the day.

Briefly, if investors make a decision to sell their share, as fallen close to the offer price to anticipate realizing losses, as suggested by Sherfrin and Statman (1985) that offer price is a

benchmark below that investors are reluctant to realize their losses, this scenario would predict increased volume even if majority of trading during the day is done below the offer price (Kaustia Markku, 2004). Overall, the effect on increasing trading volume on winners stock is probably weaker than losers stock.

Some of the data and variables described above can be presented as following operational framework:

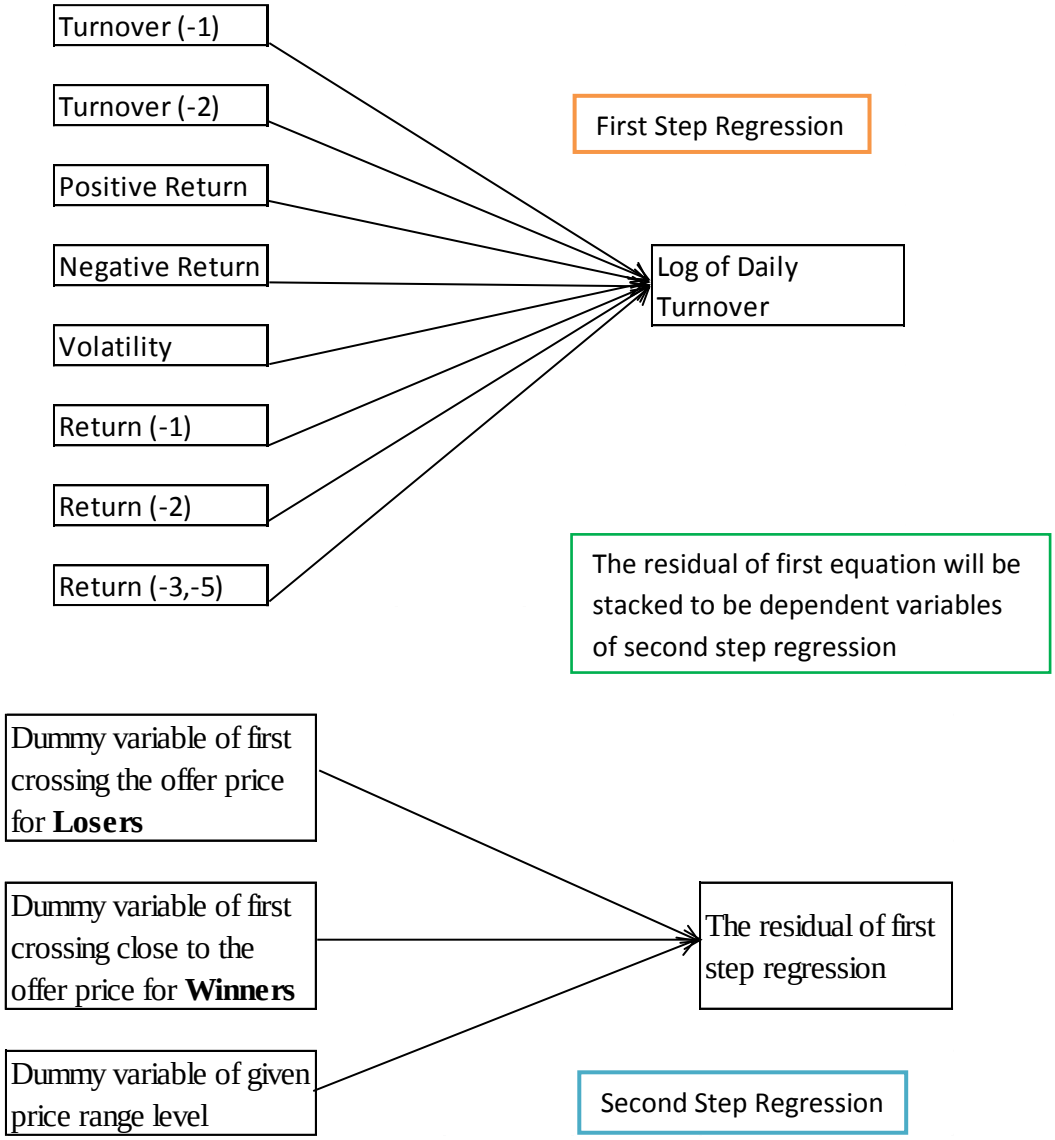

Data Framework: Collected and Classified
Data collected from ICMD, consist of; trading volume and stock return of firm between offer dates of IPO and 2 years trading day after. The offer dates between January 1, 2000 and December 1, 2010. Then, collected data from IDX about number shares offered in IPO for each firm between that time.
The sample of each firm classified based on the first trading day of IPO; winners– firms with positive initial return, losers – firms with negative initial return, neutral – firms with zero initial return'.
Then, the sample winners and losers classified in more detail based on the event of crossing the offer price between days 21 – 508; Winner Subsamples – firms with positive initial return that close the offer price from above for the first time, Losers Subsamples – firms with negative initial return that cross the offer price from below for the first time. These subsamples are used for regression analysis.
Methodology Framework: Regression of Daily Turnover
On the first step of regression, I estimate a model of normal turnover for each firm separately. The turnover variables (lagged turnover) and stock return variables (maximum and minimum return, volatility and lagged return) are used to determine the abnormal turnover.
On the second step of regression, I run an OLS pooled regression on the first step residuals to determine the magnitude of behavioral effect. The individual error from step ones' regressions are stacked to form to be dependent variables. I use a set of dummy variables that indicate crossing of specific stock price levels and trading within specific price ranges.



3. Research Model

This research use two step of regression, in the first step regression I estimate model of normal turnover. Eight independent variables are added to determine the estimation of abnormal turnover. Then, in the second step regression the residual of first step regression are stacked to be dependent variables. Some dummy variables of event of crossing offer price for the first time and price range dummies are added to know the ability of reference price to explain the abnormal trading volume, one is the disposition effect. The research model as follows:

Figure 2.1
The Research Model of First and Second Step Regression



Source: Markku Kaustia (2004) research

4. Research Hypothesis

a. There is an increase in trading volume for negative initial return IPOs' as they exceed the offer price for the first time
b. There is an increase in trading volume for positive initial return IPOs' as they falls below (relative) to the offer price for the first time.
c. Trading volume is higher on the specific price levels above the offer price than below the offer price.

CHAPTER III

RESEARCH METHOD

This research ought to test the defined hypotheses using determined method. In this chapter this research will define research samples, data, data collection method, data sources, and data analysis method.

3.1. Research Variables and Operational Variables Definition

Research variable is an attribute that as a particular variant set by this research to be learned and drawn the conclusion from. In this research I use two steps procedure for estimating the behavior of turnover for two subsamples; losers and winners. First I estimate a model of normal turnover for each firm separately. I then run a pooled OLS regression on the first step residuals as dependent variables to determine the magnitude of behavioral effect.

In the step one regression (individual firm regression) i use 8 variables input (independent variables) and 1 variables output (dependent variables) to determine the abnormal turnover. In the independent variables I include contemporaneous return, lagged return and lagged volume as explains in literature review. The independent variables are; turnover (-1), turnover (-2) as volume variables and stock return; positive and negative return, volatility, return (-1), return (-2), return (-3,-5). The dependent variable is daily turnover.

In the step two regressions, I run an OLS pooled regression with step one residual (the individual error) as dependent variables to estimate for determining the magnitude of behavioral effects. I use a set of dummy variables indicate crossings of specific stock price levels and trading within specific price ranges. The independent variables are; 1st CROSS *X* B, Relative of *X* A, RANGE [X_1, X_2].

The variables used in this study were based on the literature review. Research variables used at this research are as follows:

3.1.1. Volume Variables

Currently there is no generally accepted method for measuring abnormal trading volume. Trading volume determined by dividing the number stocks traded at certain period with the number of listed stocks (Jogiyanto, 1998). Trading volume reflects the power of supply and demand which also reflects the manifestation of investor behavior. Follows to most recent studies (Smith Bamber et. al, 1991; Jogiyanto, 1998; Chordia and Swaminathan, 2000), turnover (number of shares traded divided by number of shares outstanding) can be used for measuring trading volume. Below is the turnover formula calculation:

$$\text{Turnover} = \frac{\text{Number of Shares Traded}}{\text{Number of Shares Listed / Outstanding}}$$

Gallant et al. (1992) find complex nonlinear interactions between prices and volume in both lagged and contemporaneous effect as explain in chapter 2

(literature review). I include lagged turnovers as follows. Below is the lagged turnover formula calculation:

$$\text{Turnover } (-n) = \frac{\text{Number of Shares Traded at days (-n)}}{\text{Number of Shares Listed at days } (-n)}$$

Briefly, all of volume variables; lagged turnover will be influence the daily turnover of firm. Therefore, the dependent variable is daily turnover of each firm. Below is the daily turnover formula calculation:

$$\text{Daily Turnover of Firm}_i = \frac{\text{Number of Shares Traded of Firm}_i}{\text{Number of Shares Listed of Firm}_i}$$

3.1.2. Stock Return Variables

Ang (1997) definition about return is the rate of profit that gained by the investor from its investment. Investor motivated to invest their money with expectation to gain a proper return. Without guarantee to gain return, investor will reluctant to invest. Ang also said that return has been an investor prime motive despite the type of the investment, whether it's a long term or short term investment.

Suad Husnan (1998) mentioned that expected return is an income to be received by investors on their investment in the issuer company in the future. The profitability is strongly affected by the company's prospect in the future. An

investor will expect a certain return in the future, if the investors already achieve it so the return became realized return. Return formulated as below:

$$\text{Return} = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Where:

P_t = Stock price at period t

P_{t-1} = Stock price at previous period

I also follow Kaustia Markku (2004) in the effect of contemporaneous return by considering positive and negative returns separately. Gallant et al. (1992) found complex nonlinear interactions between prices and volume in their research of bot lagged and contemporaneous effect. I include lagged return for maximal 5 days to observation days; more details are one and two day's relative. They also found a positive relation between volatility and volume. I follows include volatility which measured by squared return.

3.1.3. Dummy Variables

Prospect Theory states that risk-aversion increase when investors have made a gain and decrease when loss. This explanation for the disposition effect is typically based on the prospect theory of (Kahneman and Tversky, 1979) which found the phenomenon of "risk seeking over losses and risk aversion over gains". Based on the discussion above, that explains the investors' phenomenon of risk-

seeking in the domain of losses, risk-averse in the domain of gain, the regret of investors to realize their losses and the pride to realize their gain. The market implications of the disposition effect should be seen; trading volume should be higher when the stock is trading above the offer price vs. trading below the offer price, if investors are reluctant, regret and risk-seeking to trade lossmaking shares.

$$\text{Dummy Variables for Price Range} = \text{RANGE } [X_1, X_2]$$

Where:

X_1 and X_2 is the price range level E.g. RANGE [1,10.1,15] indicates a gain of greater than or equal 10% but less than 15% from the offer price.

Regret theory concern about the fear of investors to realize their loss. In the domain of loss investors tend to hold the stock because of their regret of loss and if the stocks exceed the purchase price, investors accelerate the selling stock to get a gain beside their reluctance to realize loss anymore. Therefore, the immediate effect should be seen when the market price of an IPO with a negative initial return (losers) exceed the offer price for the first time. Kaustia Marrku (2004) said that if the disposition effect is significant enough to affect asset pricing, it should show up in trading volume. Below is the dummy variable for loser stock:

$$\text{Dummy Variable for Loser Stock} = 1^{st} \text{ CROSS } X \text{ B}$$

Where:

1st CROSS *X* B is the event of negative initial return stock crossing the level *X* relative to offer price from below for the first time.

Once again, regret theory explain the fear of investors to realize their loss. This theory should also explain the disposition effect in winners stock. Investors in winning IPOs' whose price initially positive but subsequently decrease close to the offer price might be urged to sell their shares in anticipation and fear of losses. This scenario related with principle of the disposition effect; holding losers to long and holding winner to short/early, the investors is predicted to sell their shares before start to having loss.

Briefly, if investors make a decision to sell their share, as fallen close to the offer price to anticipate realizing losses, as suggested by Sherfrin and Statman (1985) that offer price is a benchmark below that investors are reluctant to realize their losses, this scenario would predict increased volume even if majority of trading during the day is done below the offer price (Kaustia Markku, 2004). Overall, the effect on increasing trading volume on winners stock is probably weaker than losers stock. Below is the dummy variable for winner stock:

Dummy Variable for Winner Stock = Relative X A

Where:

Relative *X* A is the event of positive initial return stock on the level *X* relative to offer price from above for the first time.

Table 3.1
Operational Definition

Variable	Definition	Formula	Scale
Daily Turnover	The number of shares traded divided by the number of shares listed for each firm daily.	$\frac{\text{Number of Shares Traded of Firm}_i}{\text{Number of Shares Listed of Firm}_i}$	Percentage
Turnover (-1)	Turnover at day –1 relative to observation day. (lagged 1 trading days relative to observation days.)	$\frac{\text{Number of Shares Traded (-1 trading days)}}{\text{Number of Shares Listed (-1 trading days)}}$	Percentage
Turnover (-2)	Turnover at day –2 relative to observation day. (lagged 2 trading days relative to observation days.)	$\frac{\text{Number of Shares Traded (-2 trading days)}}{\text{Number of Shares Listed (-2 trading days)}}$	Percentage
MAX[*R*,0]	The rate of profit that gained by the investor from its investment. Return if it is positive, Zero if return is	$\frac{Pt-Pt-1}{Pt-1}$	Percentage

	negative.		
-MIN[*R*,0]	The rate of profit that gained by the investor from its investment. Absolute value of return, if return is negative, Zero if return is positive.	$\left\lvert \frac{Pt-Pt-1}{Pt-1} \right\rvert$	Percentage
Volatility	The movement of increase or decrease in a given period of stock price	$(\text{Return})^2$ (Return Squared)	Percentage
Return (-1)	The rate of profit that gained by the investor from its investment lagged 1 trading days relative to observation days.	$\frac{P_{t-1}-P_{t-1-1}}{P_{t-1-1}}$	Percentage
Return (-2)	The rate of profit that gained by the investor from its investment lagged 2 trading days relative to observation days.	$\frac{P_{t-2}-P_{t-1-2}}{P_{t-1-2}}$	Percentage
Return (-3,-5)	The rate of profit that gained by the investor from its investment, calculated from the closing price of day -6 to the closing price of	$\frac{P_{t(-5till-3)}-P_{t-1-(-5till-3)}}{P_{t-1-(-5till-3)}}$	Percentage

	day -1 relative to observation days.		
RANGE [X_1,X_2]	A dummy variable of a given price range: 1 if stock price is inside the price range [X_1,X_2], 0 otherwise. E.g. [1,10.1,15] get value 1 on all days that the return index indicates a gain of greater than or equal to 10% but less than 15% from the offer price, 0 otherwise.	RANGE [X_1,X_2]	Numeric
1st CROSS *X* B	A dummy variable of the event of negative initial return stock crossing the level *X* relative to offer price from below for the first time. E.g. 1st CROSS 1,10 B get the value of 1 on the day that the stock price for the first time closes above the level of 1,10 times offer price,	1st CROSS *X* B	Numeric

	coming from below level.		
Relative *X* A	A dummy variable of the event of positive initial return stock on the level *X* relative to offer price from a above for the first time. E.g. Relative 1,05 A get the value of 1 on the day that the stock price for the first time closes above the level of 1,05 times offer price, coming from above level.	Relative *X* A	Numeric

3.2. Population and Research Sample

Population used in this research is all companies which go public (IPO) at Indonesia Stock Exchange from 2000 to 2010 period. Because of some problem happen with the current data like no trading days, issues' dates and offer price is not matching between ICMD and IDX. Purposive sampling is used to determine sample selection, which means non-probability sample which custom designed to exact criteria depends on the research. Criteria samples used are as follows:

1. The offer date in IPO activity is match between data on ICMD and IDX.

2. The offer price in IPO activity is match between data on ICMD and IDX.
3. The closing price in IPO activity is match between data on ICMD and IDX.
4. The value of market capitalization on the first trading day IPO activity is match between data on ICMD and IDX.
5. The value of number shares listed on IPO activity is match between data on ICMD and IDX.
6. At least available of 2 years trading days after IPO activity (460-493 trading days).
7. No delisting or relisting activity during 2 years trading days after IPOs' activity.
8. Samples must be active traded during research period (relative).
9. IPO with trading volume <100 trading days are eliminated, this because of hind the classical assumption test.
10. True IPO, excluding company that having made another IPO later (second IPO).
11. Excluding firm that have more than 15 days of missing volume information in ICMD.
12. Excluding firm that have no true information about total shares listed on the IPOs' activity.

13. Excluding firms that have very low trading volume on the first trading day of IPOs' activity, this is maybe because of wrong issue date (not matched) between ICMD and IDX.

All selected samples above (after eliminated and adjustment criteria) are classified to be 3 criteria; winners, losers, and neutral.

1. Winners: Samples with positive initial return (>0) at the first trading day of IPOs' activity.
2. Losers: Samples with negative initial return (<0) at the first trading day of IPOs' activity.
3. Neutral: Samples with zero initial return (=0) at the first trading day of IPOs' activity.

The samples must be selected again with several criteria to capture the disposition effect, and that's called the subsamples. Later the subsamples are used in the first and second step of regression. Subsamples are classified in two, winner subsamples and loser subsamples. Criteria used for subsamples as follows:

1. For winner samples: firms with initial return >0 that the stock prices crosses the offer price from above (relative) for the first time between days 21 and 493.

2. For loser samples: firms with initial return <0 that the stock prices crosses the offer price from below (relative) for the first time between days 21 and 493.
3. Eliminated all neutral firm: firm with initial return =0 (because study of disposition effect must be belong to winners or losers)

3.3. Data Type and Source

Type of data used in this research is secondary data, which is data that not obtained by researcher directly. Secondary data is a data compiled by bank data from institution or organization and published to public and data user. As said by Sekaran (2000), secondary data are company resources or archive, government publication, and industry analysis offered by media such as website, paper release, internet, and other publication. Data used in this research are secondary data as follows:

a. Offer price on IPO activity for each sample during research period
b. Closing price on IPO activity for each sample during research period
c. Stock price for each sample during research period
d. Trading volume for each sample during research period
e. Number of shares traded for each sample during research period
f. Number of shares listed in IPO activity for each sample during research period

In this research, secondary data obtained from ICMD and IDX, books, journal, thesis, articles, and websites related to the topics which have been selected such as those reports which published in range 2000-2010 of range.

3.4. Data Collection Method

Data in this research are collected by following methods:

1. Documentation

   Documentation performed by data collection from bank data like Indonesia Capital Market Directory (ICMD), Indonesia Stock Exchange Corner in Diponegoro University, and Statistic at Indonesia Stock Exchange website which reported separately with ICMD data.

2. Sampling Method

   Samples picked non-randomly. Sampling method used in this research is purposive sampling. It means samples are picked and designed to fulfill several requirements to be count as proper for the research. The number of samples is not specifically designated. It may be as many as possible as long those samples meet the requirements.

3. Literature Study

   Literature study used to collect data which couldn’t be obtained from financial report or historical data like theories, definitions, previous

research, etc. The data was obtained from books, journals, thesis, magazines, websites, etc.

3.5. Data Analysis

Analysis data is a method that used to process result of research which useful to get a decision. This research I use a two-step procedure for estimating the behavior of turnover for two subsamples. First I estimate a model of normal turnover for each firm separately. Then I run a pooled OLS regression on the first step residual to determine the magnitude of behavioral effects.

In step-one regression I control some independent variables; turnover (-1), turnover (-2) as volume variables and stock return; positive and negative return, volatility, return (-1), return (-2), return (-3,-5) as stock return variables and the daily turnover as dependent variable to determine the abnormal turnover for each firm.

In step-two regression I use a set of dummy variables indicate crossings of specific stock price levels and trading within specific price ranges. The independent variables are; 1st CROSS *X* B, Relative *X* A, RANGE [X_1, X_2] with the first step residual (individual error) regression as dependent variables. Before doing the regression analysis, Classical Assumption Test must be done.

3.5.1. Descriptive Statistic Test

Statistics descriptive give a view or description of data which are looked from mean, median and standard deviation (Ghozali, 2004).

3.5.2. Classic Assumption Test

Before performing regression testing, the classic assumption test must be done at first. Ghozali (2005) states that multiple linear regression analysis needs to avoid the distortion of classical assumption. We have to make sure that no problems arise in the use such analyzes. Generally, the regression model (including OLS regression) have 3 value; Y (as dependent variables), X (as independent variable) and μ (as residual of model) which value of Y is depend on the both X and μ. So, to predict the value of Y, we have to know how the value of X and μ are earned. Therefore, we have to know the assumption about value of X and residual value of μ to estimate and interpret the regression model.

Gujarati (2003) is states that there are 11 assumptions which used to be based of *Classical Linear Regression Model* (CLRM) which used *Ordinary Least Squared* (OLS) method or generally known as Classical Assumptions. Those of assumption as follows:

1. The model of regression is linear: it is mean linear on the parameter as follows:

$Yi = \alpha + \beta 1Xi + \mu$

2. The value of X is assumed to be non-stocastic: it is mean that the value of X is to be assumed constant on the repeat sample.

3. The average of residual value of μi is zero (0), or $E(\mu i|Xi) = 0$
4. Homokedasticity: it is mean that the residual variance is equal for each period and form on the mathematic equation $Var(\mu i|Xi) = \sigma^2$
5. There is no autocorrelation of each residual or on the mathematic equation $Cov(\mu i,\mu j|Xi,Xj) = 0$
6. Between μi and Xi is free for each other (independent), so $Cov(\mu i|Xi) = 0$
7. The number of observation (n) is must to be big than the number of parameter estimation. Alternatively, the number of (n) is more than the number of independent variable
8. There is variability in the value of Xi, it is mean that the value of Xi must be different.
9. The regression model has been specification correctly. It is mean that there is no bias (residual) specification in the model which used in the empirical analysis.
10. There is no perfect multicolinearity between each independent variable.
11. The value of residual μi is normally distributed or $\mu i \sim N(0, \sigma^2)$.

3.5.2.1. Data Normality Test

The data normality test aim to test whether the regression model, or residual cofounding variables has a normal distribution (Ghozali and Ratnomo, 2013). T-test assumes that the residuals value follow the normal distribution. If

this assume is violated, so this statistic test becomes invalid for a number of small samples. There are two ways to detect whether the residuals are normally distributed or not; with chart analysis or statistical test. But (Ghozali and Ratnomo, 2013) suggested to use formal test in analyze residual normality assumption.

When using graphics, the normality is generally detected by looking at the histogram tables. However, misleading can happen if we just looking at the histogram tables especially from small samples sizes. A good model of regression has a normal distribution or near normal. The proof of whether a data has a normal distribution can be seen from the shape of the distribution of data in the histogram and normal probability plot compared with cumulative distribution from the normal data. The basic retrieval using the normal probability plot as follows (Ghozali, 2005):

a. If the data spread above the diagonal line and follow the direction of diagonal line or that histogram graphic and show a normal distribution pattern, so the regression is fully meet the normality assumption.
b. If the data spread far from the diagonal line and/or does not follow the direction of the diagonal line or that histogram graphics and does not show the normal distribution, so the regression model is not fully meet the normality assumption.

The normality test with graphic can be misleading if we do not focus of visually looked. The graphic seems looked formal but not in statistic otherwise.

Therefore, it's much recommended to do the statistic test besides do the test with graphic.

Mostly, test of residual normality used Jarque – Bera (JB). JB test is aimed to test big samples (asymptotic). First, calculate skewness value and kurtosis for the residual, and then do the JB test. If the probability of JB test is less than 0,05 it's mean that data is not normally distributed. Ghozali and Ratnomo (2013) suggest that assumption of residual is normally distributed are used especially for small samples. Therefore, we can ignore it for big samples. Assumption classic test is better focus in the heterokedasticity or autocorrelation which can lead to invalid decision statistic taking. This research also follows this step, using Jarque – Bera (JB) test to determine whether the residual are normally distributed.

Another formal test to test normality residual is Ramsey Test. This test is developed by Ramsey on 1969s. Ramsey suggested a test called *general test of specification* or RESET. To do this test, we have to assume that the model is right. This test is aimed to generate F-test. We can look on the result of Ramset RESET test in F-calculated. If the F-calculated is >0,05 (use significance 5%), we can conclude that the model is righted specifically.

3.5.2.2. Multicolinearity Test

The multicolinearity test is aim to test whether the model of regression found a correlation between independent variables. A good model of regression should without correlation between the independent variables. If the independent variables are correlated each other, so this variables is not orthogonal (orthogonal

variable is the independent variable which the correlation' value between independent variables are equal zero).

To detect whether the multikolinearity is founded in the model of regression, can be seen from the tolerance value or his opponent. VIF (Variance Inflection Factor) in the model of regression as follows:

a. The value of R^2 which produced by an estimation of empirical regression model is very high, but individually those of independent variable are many not significant affect the dependent variables.
b. We can analyze from the matric of independent variables correlation. If between independent variables is founded a high correlation (above 0,90), then this an indication of multikolinearity. The multikolinearity of independent variables may be due to two or more combinations' effect of independent variables.
c. The multikolinearity also can be seen from (1) tolerance value and (2) the Variance of Inflection Factor (VIF). These is show which independent variables explained by another indepenendent variables. In the simple term, each independent variable be dependent (bound) and regress to another independent variables. The tolerance measures the selected independent variables' variability that not explained by other independent variables. So, the low tolerance value are equal with high VIF (because VIF = 1/tolerance). The cut off value which generally used to show whether found the multikolinearity or not is the tolerance value 0,10 or equal with VIF value >10.

Each researcher has to determine the level of kolinearity which can be tolerated. For example, the tolerance value = 0,10 equal with level of kolinearity 0,95. Although the multikolinearity can be detected from the tolerance value and VIF, but we still do not know which independent variables are the most correlated.

d. This measures is show that each independent variables explained by other independent variables. The tolerance measures the variability of selected independent variables which not explain by other independent variables. So, the low tolerance values are equal with high VIF values. The cut off value which generally used to show whether multikolinearity is found or not is the tolerance value ≤ 0,10 or equal with VIF value ≥ 10 (Ghozali, 2005).

Another way to detect the multicolinearity is used matric correlation. The matric correlation will show the correlation between each independent variable. Ghozali and Ratnomo (2013) suggest that benchmark below for multicolinearity is that 0,90. If there is no correlation above 90% between each independent variable, we can conclude that there is no multicolinearity between each independent variable. This research also follows this step which used matric correlation independent variables as suggested by Ghozali and Ratnomo (2013) to determine whether multicolinearity is presence or absence in the regression model.

3.5.2.3. Autocorrelation Test

Autocorrelation test is aim to determine whether the correlation between residual on *t* period with *t-1* period is found or not. If the correlation is happen, so there is a problem called autocorrelation. Autocorrelation arise because sequential observation overtime is correlated to each other. This problem arise because of the residual is not independent from one observation to another observation. It is often found on the time series data because of 'interference' to an individual or same next group. On the cross-section data, autocorrelation is rare because 'trouble' on the observation came from different individual or group of observation (Ghozali and Ratnomo, 2013). A good regression model is independent from autocorrelation.

The method used to detect the presence or not of the auto correlation is the Durbin Watson test (DW). This test calculated based on the amount of difference sequence residual quadrat value. The decision-making whether there is autocorrelation or not according Ghozali (2005) are:

a. DW value is on the upper bond (du) and (4-du), then the autocorrelations' coefficients are equal zero, indicate that there is a positive autocorrelation.
b. If the DW value is low than lower bond (dl), then the autocorrelations' coefficients are more than zero (>0), indicated that there is a positive autocorrelation.

c. If the DW value is low than lower bond (dl), then the autocorrelations' coefficients are less than zero (<0), indicated that there is a negative autocorrelation.

d. If the DW value is between upper bond (du) and lower bond (dl) or DW is between (4-du) and (4-dl), then the result is inconclusive

Table 3.2
Durbin-Watson d-test

Null Hipotesis	Decision	If
No positive autocorrelation	Decline	$0 < d < dI$
No positive autocorrelation	No decision	$dI \leq d \leq du$
No negative autocorrelation	Decline	$4 - dI < d < 4$
No negative autocorrelation	No decision	$4 - du \leq d \leq 4 - dI$
No autocorrelation, about positive and negative	Not decline	$du < d < 4 - du$

Another way to correct the standard error regression OLS is that Newey-West Method. Correcting standard error of autocorrelation is done with the procedure developed by Newey-West. This procedure is the development of *White Heteroscedasticity-consistent standard error*. Standard error that has been corrected is called HAC (*Heteroscedasticity and Autocorrelation-Consistent*) standard errors or Newey-West *standard error* (Ghozali and Ratnomo 2013).

Correcting by Newey-Test method is generally selected by some researchers because it is easy to use than GLS method. In the other hand, Newey-West method can be used for correcting both heteroscedasticity and autocorrelation on the same time (Gujarati, 2003). Meanwhile, *White heteroscedasticity-consistent standard error* just only settles the heteroscedasticity problem.

The output of regressions' result can be used directly in the research report. If we compare the result without HAC method, we can conclude that there are some different in the standard error value, t-calculated and probability. Nevertheless, the result corrected by HAC is more valid than without HAC that can lead to the wrong decision taking (Ghozali and Ratnomo 2013).

This research use Durbin-Watson method to determine whether autocorrelation is presence or absence in the regression model. If in the model is founded positive autocorrelation, Newey-West method are used to correct the standard error and result of t-statistic and the propability.

3.5.2.4. Heteroscedastisity Test

Classical assumption from linear regression model is residual value or error in the regression model is homocedasticity or has a same variance. There are some reasons why the residual value is not constant but have a variance, as follows:

a. Heteroscedasticity happen because of data outlier (extreme data).

b. Heteroscedasticity also happen because the regression model had specified correctly. This means that there is a false in the specification model; there is an important independent variables yet included to the model.
c. *Error-learning Model.*
d. The increase of variance on the model.

Heteroscedasticity problems generally happened on the cross-section data than time-series data. On the cross-section, population have a different size; small, medium and big. On the other hand, time-series data tend to have a sequel same size because the data is collected on the same intensity on the given period (Ghozali and Ratnomo 2013)..

Heteroscedasticity is not make an estimator (coefficient of independent variables) to be biases because the residual is not their calculated component. Nevertheless, heteroscedasticity can make the estimator to be not efficient and *BLUE* anymore and the standard error from the regression model to be biases. It will affected the t-statistic and f-calculated to be biases (misleading). The last result is the decision taking of statistic for hypothesis test is not valid (Ghozali and Ratnomo 2013)..

There are two was to detect presence or absence the heterokedasticity; graphic method and test statistic method. Graphic method is more easy but have a significantly weakness because the number of observation influence the graphics' appearance. Nevertheless, more small the number of observation, it will be hard to

interpret the result of graph. Moreover, interpretation of each person can be different on when looking on the graphic pattern. Therefore, statistic test is needed to insure the results' accuration. Detecting the heterokedasticity with graphic method, as follow:

1. By looking on the scatterplot between the dependent variables prediction value; ZPRED with the residual SRESID. Detection of presence or absence the heterokedasticity can be done by looking the given pattern on the scatterplot graphic between SRESID and ZPRED where the Y line is predicted Y, and X line is the residual that have been distudentized. Scatterplot test which no heterokedasticity have to fulfill this condition, as follows:
    a. If there is a given pattern like tears that formed a given pattern (waved, spread, etc), it's indicate that heterokedasticity is happen.
    b. If no specific pattern and tears spread above and below the zero number 0 on the Y line, it's means that heterokedasticity is not happen.

The interpretation of graph is not accurate (relative), and it should supported by some formal test to insure accuration of the result. There are some statistic tests that can be used to detect presence or absence heteroscedasticity; (1) Glejser, (2) White, (3) Breusch-Pagan-Godfrey (BPG), (4) Harvey, (5) Park, (Ghozali and Ratnomo 2013).

Glejser test suggested to regress the value of absolute residual (AbsUi) with another independent variables. If the coefficient of independent variables X_1 (yaitu β) is significant in statistic, the conclusion is there is a heteroscedasticity on the model. On the other hand, Glejser is similar with White test. According to White, this test can be done with regress the residual square (U^2i) with independent variables, independent variables squared, and interaction of each independent variable. The test is that if c^2 calculated > c^2 table, the conclusion is there is a heteroscedasticity Ghozali and Ratnomo 2013).

3.5.3. Ordinary Least Square (OLS) Regression

Ordinary Least Square regression is used to test the influence of two or more independent variables with one dependent variable and generally form in the equation as follows:

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 \ldots \beta iXi + \mu$$

The estimation model above is called Ordinary Least Square (OLS) method. The aim of regression analysis is not only to estimate the value of $\beta 1$ and $\beta 2$, but also to make a value of conclusion from $\beta 1$ and $\beta 2$. For example, we want to know how close the value of $\beta 1$ and $\beta 2$ based on their sample with the real value of $\beta 1$ and $\beta 2$ based on their population. As looked on the equation above, the value of Y is depend on the both X and μ. So, to predict the value of Y, we have to know how the value of X and μ are earned. Therefore, we have to know

the assumption about value of X and residual value of μ to estimate and interpret the regression model.

This research uses 8 independent variables in the first step regression where each firm will be regress separately. The total subsamples of winners are **68 Firm** and **12 Firm** for losers, and then the residual of first step regression will be stacked to be dependent variables of second step regression OLS pooled data. Here the equation of first step regression as follows:

$$\mathbf{Y = \alpha + \beta 1 X1 + \beta 2 X2 + \beta 3 X3 + \beta 4 X4 + \beta 5 X5 + \beta 6 X6 + \beta 7 X7 + \beta 8 X8 + \mu}$$

Where:

Y = Log of Daily Firm Turnover (Number of Shares traded divide by Number of shares Listed)

α = Constanta

β = Coefficient of regression

***X*1** = Log of Lagged Turnover (-1); Turnover at days -1

***X*2** = Log of Lagged Turnover (-2): Turnover at days -2

***X*3** = Positive Return: return if it is positive return, 0 if it is negative return

***X*4** = Absolute Negative Return: absolute return if it is negative return, 0 if it is positive return.

***X*5** = Volatility: return squared

***X*6** = Return (-1): return at days -1

***X*7** = Return (-2): return at days -2

$\boldsymbol{X8}$ = Return (-3,-5): sum of return, start at days -5 till days -3

$\boldsymbol{\mu}$ = Error: residual of model

3.5.4. Goodness of Fit Regression Model

The accuracy of regression model function in the forecasting the actual value can be measured from *goodness of fit*. Statistically, it can be measured from coefficient determination value, F-statistic value, and t-statistic value. The statistical calculation is significant in statistic if the value of their statistic test is on the critical area (area where H_0 is rejected). Otherwise, it is not significant if the value of their statistic test is on the area where H_0 is accepted (Ghozali and Ratnomo, 2013). This research also follows the goodness of fit to value the regression model by coefficient determination, t-statistic value, and probability F-value.

3.5.5. Coefficient Determination (R^2)

The main purpose of coefficient determination is measures how far the ability of model explains the variance of dependent variable. Coefficient determinations' value is between zero (0) and one (1). If the value of R^2 is low, it is means that the ability of independent variables in explains variance of dependent variable is very limited. Otherwise, if the value is almost close to the

one (1), it is means that the independent variables give almost all of information needed to predict variance of dependent variable (Ghozali and Ratnomo, 2013).

The weakness of coefficient determination is bias with how much the number of independent variables in the model. Every one additional of independent variable, the R^2 value is increase no matter whether that variable is influence significantly with dependent variable. Therefore, many researchers suggest using *adjusted* R^2 value when evaluate which the best model is. Just not like R^2, *adjusted* R^2 value can be increase or decrease if one of independent variable is added to the model (Ghozali and Ratnomo, 2013).

3.5.6. Individual Parameter Significance Test (*t-statistic*)

The main idea of t-test is to show how far the influence of one independent variable with dependent variable with assumption if other independent variable is constant. If the assumption of residual normality is filled; $\mu i \sim N(0,\sigma^2)$, we can use t-test to test the partial coefficient of regression. For example, if we want to test whether variable X1 influence Y with assumption variables X others is constant:

$$\mathbf{H_0: \beta 1 = 0} \quad \text{and} \quad \mathbf{H_a: \beta 1 \neq 0}$$

t-test:

$$\mathbf{t = \frac{\beta 1}{se(\beta 1)}}$$

Where $\beta 1$ is coefficient parameter and $se(\beta 1)$ standard error of coefficient parameter. If the t-calculate value > t-table $t\alpha$(n-k), so H_0 is rejected and it is means that X1 is influence Y. α is level of significance and (n-k) is the degree of freedom: the number of (n) observation minus by the number of independent variable in the model (Ghozali and Ratnomo, 2013).

3.5.7. Simulant Significance Test (F-Statistic Test)

F-statistic test shows whether all independent variables which included in the model have together simultaneously influence the dependent variable. The null hypothesis is *joint hypothesis* that $\beta 1$, $\beta 2$, $\beta 3$,..... βk are simultaneously equal to zero (0).

$$\mathbf{H_0: \beta 1 = \beta 2 = \beta 3 \ldots = \beta k = 0}$$

Testing of this hypothesis is sometimes called *overall significance* whether Y is linearly associated with both X1 and X2. The *joint hypothesis* can be tested with variance analysis technique ANOVA (Ghozali and Ratnomo, 2013).

The decision taking:

Assume a regression model with *k*-variables:

$$\mathbf{Yi = \alpha + \beta 1 X1 \mathit{i} + \beta 2 X2 \mathit{i} + \beta 3 X3 \mathit{i} + ... + \beta k Xk \mathit{i} + \mu \mathit{i}}$$

H_0: $\beta 1 = \beta 2 = \beta 3 \ldots = \beta k = 0$

(All of coefficient slope are simultaneously equal to zero (0)

H_a: not all of coefficient slope are simultaneously equal to zero ($\neq 0$)

The F-statistic calculation as follows:

$$\mathbf{F} = \frac{\mathbf{ESS / df}}{\mathbf{RSS / df}} = \frac{\mathbf{ESS / (k-1)}}{\mathbf{RSS / (n-k)}}$$

If F-calculated > F-table: $F\alpha$ (k-1,n-k), it is means that the null hypothesis is rejected. Where $F\alpha$ (k-1,n-k) is critical value of F on the significance level of α and degree of freedom (df) pembilang (k-1) and degree of freedom (df) penyebut (n-k). There is a tight connection between coefficient determinations of (R^2) and F-test value. Mathematically, F value can be form on the equation as follows:

$$\mathbf{F} = \frac{\mathbf{R^2 / (k-1)}}{\mathbf{(1 - R^2) / (n - k)}}$$

Based on the equation above, we can conclude that if $R^2 = 0$, so F is equal zero too. Greater the R^2 value, greater F value. Nevertheless, if $R^2 = 1$, so F become to be infinity. So we can conclude that F-statistic test which measures significance totally from the regression model can be used to test significance from R^2. It is means that F-statistic test is equal with test to R^2 value = 0 (Ghozali and Ratnomo, 2013).

3.5.8. Pooled Regression

There are some kind of data available to be analyzed statistically it is *time series*, and *cross-section*. Cross-section is often called pooled data. Briefly, pooled

data panel can be defined as a group of data where the behavioral each unit is observed in several time (Ghozali and Ratnomo, 2013).

Gujarati (2003) said that data panel technique combined *cross-section* and *time series*, give some advantage than standard cross-section or just time series, as follows:

1. By combined *time series* data and *cross-section* data, pooled data panel give more informative information with the low coleniearity of each variable, greater the *degree of freedom* and more efficient.
2. By analyze the cross-section data in several periods, pooled data panel can be used in the *dynamic change* research.
3. Data panel can detect and measure the influence which cannot be observed by pure data of *time series* or *cross-section*.
4. Data panel allows us to learn the behavior model more complex. For example, the economic scale phenomenon and technology's change can be understand more with pooled data panel than pure *cross-section* or *time series.*
5. Therefore, pooled data panel related with individual, company, city, country, etc. all the time, which will be heterogenic in that unit. Technique to estimate pooled data panel can including heterogenity explicitly to each individual variable specifically.

The principal of pooled data panel regression is combined of cross-section and time series data. In this research, the dependent variable of pooled data panel

is the residual of first step regression and the independent variable is explanatory variables as have been explained in first section of Chapter 3. The equations' function of pooled data panel as follow:

$$\mathbf{Y_{it} = Z\beta_{it} + \mu_{it}}$$

Where:

Y = Stacked error terms $\mathbf{e_1}$ of first step regression.

Z = Matrix of second step explanatory variables with value specific to firm *i.*

$\boldsymbol{\beta}$ = Coefficient of regression

μ = Error terms

i = unit of cross sectional (firm)

t = period (in this research is daily)

If every unit of cross-section has the same amount observation in time series, that data called balanced panel. If the number of observation is different between each firm (cross-section) it is called unbalanced panel. In this research i use unbalanced panel because the different of maximum 2 years trading data. The range 2 years trading data between 2000 – 2010 periods is **455 – 493** trading days of data so i use unbalanced panel. Some dummy variables are added in this step two pooled data panel regression. Dummy variables are common effect because every cross-section has to be added by dummy to capture the disposition effect, this issue will explain in the next section (Ghozali and Ratnomo, 2013).

So the question is how we estimate the regression model above? The answer is depended on the assumption we made for the intercept, coefficient of

slope and error term (Ghozali and Ratnomo, 2013). There are several possibilities as follows:

1. Assume that the intercept and coefficient of slope is constant between time and space and error terms include the different all the time and individual.
2. Coefficient of slope is constant but the intercept is varies on individual.
3. Coefficient of slope is constant but the intercept is varies both in time and individual.
4. All of coefficient is varies in individual
5. The intercept or Constanta as coefficient of slope is varies between individuals and time

3.5.8.1. Pooled Regression of *Common Effect, Fixed Effect,* or *Time Effect*?

Common effect said to be the simplest model, where the approach ignored the time dimension and firm. The method used to estimate like this is Ordinary Least Squared regression method often called *pooled OLS*. The assumption is that the intercept of each firm used to be cross-section have no difference of characteristic or difference time (Ghozali and Ratnomo, 2013).

Fixed Effect model is assume that the intercept of each firm have the possibility of difference. This difference is caused by given characteristic of each firm, i.e. managerial style or managerial philosophy. This model is often called Fixed Effect Model (FEM). The terminology of fixed effect show that although the intercept is varies for each individual, but each individual is not varies all the

time, often called *time invariant*. This method input "individuality" to each firm or every unit of cross-sectional with varies intercept to each firm, but still we assume that the coefficient of slope is constant to each firm (Ghozali and Ratnomo, 2013). Here the equation of FEM as follows:

$$\mathbf{Y_{it} = \beta_{1i} + \beta_2 X_{2it} + \beta_3 X_{3it} + \mu_{it}}$$

Equation above shows that the intercept for each firm is different. The different maybe are caused by managerial style or philosophy each firm. Fixed Effect shows although the intercept is different for each firm, but the intercept of those individual is not varies to time (*time invariant*). So how to make an intercept which can be done varies to each firm? This is can be done by variable dummy technique or called *Least-Squared Dummy Variable* (LSDV) *Regression Model* (Ghozali and Ratnomo, 2013).

Time effect also added dummy variable to incorporate effect of time with assumption that the function of equation is moved all the time because of technology change factor, the government rule, tax policy, and external factor like war or other conflict. The influence of time can be calculated in the model if we enter time dummy variables for each observation period (Ghozali and Ratnomo, 2013). So, in this research I use common effect OLS pooled regression on the second step regression.

3.5.9. Regression Model with Dummy Variables

In the regression model, dependent variable often influences not only by ratio scale variables (income, price, and cost) but also influence by qualitative variable or nominal scale i.e. gender, faith, etc. Because of dummy variable shows the presence or absence of quality or an attribute, this variable is nominal scale. The way to qualify quantitative variable above is by form artificial variable with value: 1 or 0, where 1 shows the absence of attribute and 0 shows the absence of attribute. The variables which assume value of 1 and 0 is called dummy variables (Ghozali and Ratnomo, 2013).

Generally, the way to give a code for dummy is using category which translate to 1 and 0. The group which is given 0 dummy values is called excluded group, otherwise the group which is given 1 dummy values is called included group. In this research, dummy variable are added for some event: 1 for event of crossing the purchase price from below for the first time for losers firm (i.e. event of crossing 1.05), 1 for event of approaching the purchase price from above for the first time (i.e. event of crossing 1.10), and 1 for event of given price range (i.e. 1.00 – 1.05), 0 otherwise (Ghozali and Ratnomo, 2013).

3.5.10. Dynamic Econometrics Model: Autoregressive and Distributed Lag

Regression analysis which used time series often make a regression model which not only include todays' independent variable (current) but also include

past independent variable (lagged). This model regression is called *distributed-lag* and the equation can be described as follows:

$$\mathbf{Yt = \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \ldots + \beta_k X_{t-k} + u_t}$$

Where k is lagged period, coefficient $\beta 0$ is called short run or impact multiplier because they give average change of Y of every change of X. Autoregressive model and *distributed-lag* is used widely in the econometrics analysis. So, how we estimate value of α and β? In this research I use *Ad Hoc Estimation.* Because of independent variable X is assumed non-stochastic (or have no correlation with error term Ut), so $\mathbf{X_{t-1}}$ and $\mathbf{X_{t-2}}$ is non-stochastic too.

Therefore, principally we can use Ordinary Least Square (OLS). This approach is used by Alt (1942) and Tinbergen (1949). Tinbergen suggested doing regression sequentially, it is means that regress X_t to Y, and then regress X_t , X_t-1 and X_{t-2} etc. This procedure is stop if the lagged coefficient variables are statistically to be insignificant and/or at least one of the coefficients is change from positive to negative or otherwise. In this research, as suggested by some researcher, I used 4 lagged variables: turnover (-1), turnover (-2), return (-1), and return(-2), because on the lagged of 3 days, the coefficient is decrease and insignificant statistically.