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CAPM or APT? A Comparison of Two Asset Pricing Models for Malaysia

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ABSTRACT

This study uses monthly return data on 213 stocks listed on the main board of Kuala Lumpur Stock Exchange, Malaysia for the period September 1988 to June 1997 to compare two frequently cited asset pricing models: the capital asset pricing model, CAPM and the arbitrage pricing theory, APT. A comparison was performed along the lines of Chen (1983) and the results showed the APT to perform better than the CAPM in explaining the variations in cross section of returns. The implication for investors is that the market index is but one of several sources of risk, which should be taken into account in any decision governing investment in the stock market.

ABSTRAK

Kajian ini menggunakan data pulangan bulanan pada 213 saham yang tersenarai di papan utama Bursa Saham Kuala Lumpur, Malaysia bagi jangka masa September 1988 hingga Jun 1997 untuk membandingkan dua model penentuan harga aset yang selalu diperkatakan. Model penentuan harga modal, CAPM dan teori penentuan harga arbitraj, APT. Satu perbandingan telah dipersembahkan mengikut prinsip Chen (1983) dan keputusan menunjukkan APT mempersembahkan lebih baik daripada CAPM dalam penjelasan varians dalam keratan rentas bagi pulangan-pulangan. Implikasi bagi pelabur-pelabur menunjukkan bahawa indeks pasaran adalah salah satu daripada beberapa sumber risiko yang mesti diambil kira dalam sebarang keputusan yang mengawasi pelaburan dalam pasaran saham.

INTRODUCTION

The relation between risk and return has long occupied a central position amongst the finance academics and practitioners. A lot of theoretical and empirical research has been done to examine the relationship between return and risk of an asset. Research in this area of finance received an impetus from the seminal work of Markowitz (1952), which notes that for any given amount of return, the risk of a portfolio of assets has the tendency to decline as the size of portfolio increases. In other words, diversification leads to elimination of the unique risk. Sharpe (1964) extended the work of Markowitz by developing the capital asset pricing model, CAPM, which posits that the return of a security is linearly related to the risk of that security. The CAPM has been subjected to rigorous theoretical and empirical investigations. The first attempt by Fama and MacBeth (1973) suggested that the theory was valid. Although the CAPM has enjoyed some significant following both theoretically and practically, the model has suffered in later years from several "anomalies" (see for example Chan, Hamao and Lakonishok, 1991, Jordan and Jordan 1991, and Livingston, 1977. The mounting evidence suggesting the inability of the theory to account for the cross-sectional variations in returns prompted the development by Ross (1976) of an alternative to CAPM, called the arbitrage pricing theory, APT. The APT suggests that several, not one factor accounts for the cross sectional variations in returns. Although empirical evidence on the APT has indicated its ability to account for the cross sectional variations in returns, some evidence has begun to accumulate suggesting that the CAPM, which the APT came to replace, is alive and healthy, and that the so-called anomalies were due to certain methodological errors.

This paper sets out to conduct empirical tests on both the CAPM and the APT using Malaysian data. The rest of the paper is divided into four sections. Section two reviews the literature on both the CAPM and the APT. Section three describes the data and presents the methodology adopted to estimate the two models. Section four reports the results while Section five discusses the findings.

LITERATURE REVIEW

The last two decades have seen a huge volume of theoretical and empirical work on the capital asset pricing model, CAPM. The CAPM predicts that there is a positive relation between risk and return. Although the CAPM was found to work in the early days of its discovery, the theory began to suffer some setbacks in the work of Blume and Friend (1973), Chan, Hamao and Lakonishok (1991) and Corhay Hawawini and Michel (1987). Some anomalies were found to bedevil the theory. For example it was found to suffer from seasonal anomalies such as the January effect, and weekend effect, and also to be unable to explain the differences in returns between large and small firms.

The capital asset pricing model posits a positive relationship between risk and return. In other words, if the theory is valid, one would expect that investors would be compensated for bearing risk. The basic estimating form of the model is given by the cross-sectional equation:

$$\tilde{R}_{it} = \tilde{\gamma}_{ot} + \tilde{\gamma}_{1t}\beta_i + \tilde{\eta}_{it} \quad (1)$$

where R_{it} the return on stock i on week t

β_i the beta of stock i,obtained by estimating the Sharpe's characteristic line

γ_i parameters to be estimated

η random error term, assumed to be white noise.

Fama and MacBeth (1973) used monthly return data on all common stocks listed on the New York Stock Exchange for the period January 1926 to June 1968. They defined return as the percentage change in two successive price levels. They adopt an entirely new estimation procedure that involves two steps. In the first step, they obtain estimates of beta using the Sharpe's characteristic line. The stocks are then ranked in the ascending order of beta. Twenty portfolios of approximately equal size were then formed with the first portfolio having the lowest betas and the twentieth portfolio having the highest. A subsequent period was then used to run a series of cross-sectional regressions using the betas in the first stage as the independent variable. They also used a measure of unsystematic risk in the set of independent variables. In particular, the authors broke their sample into five subperiods, and estimated four alternative forms of the empirical forms of the model.

Fama and MacBeth's (1973) results indicate that, overall, the important testable implications of the two-parameter model are supported. They therefore cannot reject the hypothesis that average returns on the New York Stock Exchange common stocks reflect the attempts of risk-averse investors to hold efficient portfolios. Specifically, they find that, on average, there seems to be a positive trade-off between return and risk, with risk measured from the portfolio viewpoint. The authors also note that although there are pockets of nonlinearities from period to period, they cannot reject the hypothesis that on average their effects are zero and unpredictably different from zero from one period to the next. Thus, the authors cannot reject the hypothesis that in making a portfolio decision, an investor should assume that the relationship between risk and return is linear. They also cannot reject the hypothesis that no measure of risk, in addition to portfolio risk, systematically affects average returns.

However, there are studies questioning the va!:dity of the CAPM. Several anomalies have been detected which question the adequacy of the model in that it could not explain such anomalies as size effect (Chan, Hamao and Lakonishok, 1991); seasonal effects (Corhay, Hawawini and Michel, 1987, Jordan and Jordan 1991); neglected-firm effect (Andrew, 1984), or differential returns in the stock market (Blume and Friend, 1973). It also suffers from misspecification as it ignores the influence of skewness (Kraus and Litzenberger, 1976); does not take cognizance of industry factors (Livingston, 1977, Bell 1974); does not take into account nonlinearity, (Gibbons 1982), and is very sensitive to the choice of the proxy for market portfolio (Tinic and West 1984). The model has also been criticized even by some of its strong advocates. In a study covering data on the NYSE for the period 1963-1990, Fama and French (1992) obtained results that do not support the central prediction of the model, that average stock returns are positively related to market addition b. In addition, Roll (1977) has presented a serious methodological criticism of the CAPM. He questions the very testability of the model and argues that the failure of empirical test may be simply a result of the researcher having chosen an inappropriate index for the market portfolio.

A recent empirical study on the CAPM on Malaysia is worth mentioning here. Sanda, Gupta and Shafie (1999) use weekly data for 224 stocks for the period January 1990 to December 1996. They defined return as the percentage change in two successive price levels. They adopted the Fama-MacBeth two-step procedure. In the first step, they obtained estimates of beta using the Sharpe's characteristic line and the stocks were then ranked in the ascending order of beta. Twenty portfolios of approximately equal size were then formed with the first portfolio having the lowest betas and the twentieth portfolio having the highest. They used a subsequent period to run a series of cross-sectional regressions using the betas in the first stage as the independent variable. They also included a measure of unsystematic risk in the set of independent variables. The authors also employ the methodology suggested by Pettengill et al.

(1995), which is a refined version of Fama-MacBeth, but takes into account of the conditional relation between beta and returns. The method suggested by Pettengill et al.(1995) runs two regressions in the testing stage: one each for periods of positive, and for periods of negative excess returns. Unlike Fama and MacBeth (1973) who find a positive relation, and Pettengill et al. who report a conditional positive relation between return and risk, Sanda, Gupta and Shafie (1999) find neither an unconditional, nor a conditional relation.

The Arbitrage Pricing Theory (APT) as originally developed by Ross (1976) is built on the twin assumptions of no arbitrage opportunity in the capital market and a linear relationship between actual returns and k common factors. The principal hypothesis of the model is that expected returns should be linearly related to the weights of the common factors in the assumed linear process. In every test of the model, the focus has been to use factor analysis to extract k factors from sample covariance matrices and then to test the hypothesis by regressing returns or average returns against the factor scores of the common factors. Most previous tests have either assumed that the number of factors is equal to some predetermined number or have estimated k simultaneously with the estimation of the factor scores. Thus, existing tests of the APT are joint tests of the APT pricing result and an assumed or estimated number of factors.

The arbitrage pricing theory is essentially based on three assumptions. First, capital markets are perfectly competitive. Secondly, investors always prefer more to less wealth with certainty. And lastly, the stochastic process generating asset returns can be represented as a k-factor cross sectional model of the form:

$$\tilde{R}_i = E_i + b_{i1}\tilde{\delta}_1 + \ldots + b_{ik}\tilde{\delta}_k + \tilde{\varepsilon}_i$$
$$for\ i = 1, \ldots, N \quad (2)$$

Where:

R_i the return on asset i,

E_i the expected return on asset i,

b_{ik} the reaction in asset i's returns to movements in the common factor δ_k

δ_k a common factor, with a zero mean, that influences the returns on all assets

ε_i an idiosyncratic effect on asset i's return which, by assumption is completely diversifiable in large portfolios and has a mean of zero;

N number of assets.

Unlike the market model, in which the common factor (i.e. some market return) is directly observable, the APT does not identify the common factors. Hence, one cannot estimate the b coefficients of Equation (2) using regression techniques, as one might wish to do if the δ's were known. Another estimation technique is needed. Fortunately, the stochastic process assumed in the equation permits one to estimate the b coefficients by using factor analysis. In the framework of factor analysis, the b coefficients are usually referred to as the factor scores and the k vectors, $\underline{b}_1$ through $\underline{b}_k$, are called the factor-loading vectors, where the dimension of each of these vectors is Nx1.

The empirical tests of the APT generally employ the standard factor analysis technique or some variants of it, and results from the tests are conflicting. While Roll and Ross (1980) find that at least three to four factors are priced, Shanken

(1982) questions the validity of the APT and Solnik (1977) casts doubt on the testability of international asset pricing models. Other studies have confirmed the testability of the model, though they differ on the underlying factors. Young, Berry, Harvey and Page (1991) find that financial variables constitute an important factor, while Oldfield and Rogalski (1981) identify Treasury bill returns as important. Burmeister and McElroy (1988) and Stehle (1977) also find support for the APT. In contrast to Roll and Ross (1980), Dhrymes (1984) show that the number of significant factors is a function of the size of the group of assets analyzed.

Some studies (eg. Cho, Eun, & Senbet, 1986, Errunza and Losq, 1985, Korajcyzk, 1996) have extended the APT to international level. Examining the empirical relevance of the international arbitrage pricing theory, Cho, Eun, and Senbet (1986) use interbattery factor analysis to estimate international common factors, and the Chow test to test for the validity of the APT. Their interbattery factor results show that the number of common factors between a pair of countries ranges from one to five, and their cross sectional results lead them to reject the joint hypothesis of international capital market integration and, therefore, to question the validity of the IAPT. They caution, however, that this does not rule out the possibility that the APT is valid locally in segmented markets.

Korajczyk (1996) extends the analysis of Cho, Eun and Senbet to some stock markets of developing and developed economies. He argues that if markets are financially integrated, capital should flow across borders to equalize the price of risk; that if they are not integrated possibly because of capital controls or other barriers, then the price of risk may differ across markets. He estimates the IAPT and finds that market segmentation is larger for emerging markets than developed markets; and that market segmentation decreases through time for many of the sample countries, suggesting a reduction in barriers to capital flows. It should be stressed that the APT is based upon the assumption that the market is efficient.

METHODOLOGY

Monthly return data were obtained on 213 stocks listed on the main board of Kuala Lumpur Stock Exchange, KLSE, for the period September 1988 to June 1997. The main selection criterion is that the stock must have been listed before October 1988. This sampling procedure is obviously non-random, and so caution must be exercised in interpreting the result as the sample may not be generalized to other stocks not included in this research.

The methodology is divided into three sections. The first section describes how the CAPM parameters are estimated; the second section shows how the APT parameters are obtained, and the third section describes how the two models are compared.

The Estimation Procedure for CAPM

The first step in the estimation of the CAPM is to divide the sample into two: odd months and even months. Dividing the sample in this way gives 53 sets of observations for each of the two subperiods. Thus, the data in each subperiod comprise 53 rows and 214 columns, with the former standing for the months, and the latter for the returns on KLCI and the 213 stocks in the sample. Chen (1983) was the first to employ the odd-even month approach in order to minimize the well-known econometric problem of errors in variables. Using the odd-months data, 213 regressions were run to obtain the betas for each of the stocks in the sample, using the time series equation:

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \varepsilon_{jt} \qquad (3)$$

The betas were then extracted and saved. The next step was to transpose the even-month data so that the original 53 x 213 matrix of observations became a 213 x 53 matrix. The 213 x 1 matrix of betas was then combined with the transposed matrix, giving a 213 x 54 matrix of observations. Each column then stood for monthly observations across all the stocks. The next step was to run 53 regressions, using the return data for each month as the dependent variable and the betas estimated in the earlier step as the independent variable. In other words, this step ensures that the parameters of Equation 1 are estimated 53 times, once for each of the 53 months. For each month, the expected CAPM returns were then obtained by subtracting the residuals from the actual. Since there are 53 such expected returns, these were averaged out to give the mean expected returns for CAPM, denoted as $E(R_{CAPM})$.

The Estimation Procedure for APT

The steps followed above were repeated for the APT with slight differences. In the first step, a factor analysis was run on the odd-month data, saving six series of factor scores[1]. The rationale for saving six factor scores is that most studies reported in the literature found between four to six factors. Several studies have found different number of sectors. For example, Chen, Roll and Ross (1986) found between 3 to 5 factors while Gultekin and Gultekin (1987) report a much bigger number. Thus, there is nothing sacrosanct about our choice of six factors: any figure in the vicinity of six could suffice. Using the factor scores as the independent variables, 213 regressions were run with the returns for each stock serving as the dependent variable, and the six factor scores as the independent variables as in the following time series equation:

$$\begin{aligned}\bar{R}_i = \; & \beta_0 + \beta_1 f_1 + \beta_2 f_{i2} + \\ & \beta_3 f_{i3} + \beta_4 f_{i4} + \beta_5 f_{i5} + \\ & \beta_6 f_{i6} + \varepsilon_i \qquad (4)\end{aligned}$$

The betas were then extracted and saved into a matrix of size 213 x 6. The even-month data matrix of size 53 x 213 was then transposed into a 213 x 53 matrix before it was merged with the matrix of betas to form a bigger matrix of size 213 x 59. Once the merger was performed, 53 cross sectional regressions were run, each involving the six column matrix of betas as the independent variables, and the return for each of the 53 months serving as the dependent variable as in the following cross sectional equation:

$$\begin{aligned}\bar{R}_i = \; & \gamma_0 + \gamma_1 \beta_{i1} + \gamma_2 \beta_{i2} + \\ & \gamma_3 \beta_{i3} + \gamma_4 \beta_{i4} + \gamma_5 \beta_{i5} + \\ & \gamma_6 \beta_{i6} + \varepsilon_i \qquad (5)\end{aligned}$$

In each of the regressions in Equation (5), the residuals were subtracted from the actual returns to obtain the expected returns, denoted as $E(R_{APT})$. The 53 series of expected returns were then averaged out to obtain a column matrix of expected APT return series.

Comparison of CAPM and APT

The literature suggests that in order to compare the two models, a regression should be run to estimate the parameters of the following cross sectional equation (Chen, 1983).

$$R = \psi_1 R_{CAPM} + \psi_2 R_{APT} + \mu \quad (6)$$

The estimates of the parameters of the equation above are then used to test for which of the two models better explains the cross section variations in returns. A pair of joint hypothesis is tested separately. The first joint hypothesis tested is of the form: $\psi_1=0$ and $\psi_2=1$, while the second joint hypothesis tested is: $\psi_1=1$ and $\psi_2=0$. If the first hypothesis is not rejected, this would be in support of APT; if the second hypothesis is not rejected, this would be in support of CAPM; and if both are not rejected, this would lead to inconclusive results. Each of the two tests imposes some restrictions on the parameters. Gujarati (1992) gives the following formula for testing the hypothesis involving linear restrictions:

$$F = \frac{(R^2 - R^{*2})/m}{(1 - R^2)/(n - k)} \quad (7)$$

where

R^2	R^2 from the unrestricted regression
R^{*2}	R^2 from the restricted regression
m	the number of linear restrictions posed
n	the number of observations[2]

RESULTS

This section presents the results obtained from a comparison of the APT and CAPM. As mentioned in the methodology section, the estimates of the CAPM parameters are obtained, followed by those of APT and then a comparison made to determine which of the two competing models better explains the cross sectional variations in returns. Appendix 1 shows the estimates of beta obtained by running a first pass regression involving the returns of each of the stocks as the dependent variable, and the returns on the KLSE composite index as the independent variable. The results in Appendix 1 are not for interpretation, but rather for use as input in the second-pass cross sectional regression. The results from the second-pass cross-sectional regression on CAPM are shown in Appendix 2, however again the results are not for interpretation, but rather are used as input for comparing the CAPM and APT.

Appendix 3 shows the beta estimates obtained by regressing the returns of each of the 213 stocks against the six factor scores obtained from the factor analysis. The beta estimates from the first-pass regression on APT are then used as input for running the second-pass cross sectional regression on APT, the results of which are shown in Appendix 4.

After obtaining all the necessary inputs for the comparison of APT and CAPM, Equation (6) was estimated. The results of the unrestricted regression are shown in the upper panel of Table 1 below. A number of observations can be made from the results obtained in the table. First, the coefficient estimate on CAPM is negative, but insignificant at the 5% level. This suggests that the CAPM does not have a significant explanatory power on the cross sectional variations in returns. The second aspect of the results in Table 1 is that the coefficient estimate of APT is positive and significant, suggesting that the APT is valid. The individual t-ratios, however, cannot be used to lead to the choice of one model over the other. Thus, two joint tests were performed and the results shown in

Table 1
CAPM or APT?

	COEFFICIENT	T-RATIO	SIG T
CAPM	-0.3897	-1.633	.104
APT	1.3602	5.989	.000
R-SQUARE	0.465		
F	172.84		
SIG F	.000		
	TEST 1	TEST 2	
CAPM	0	1	
APT	1	0	
F	1.333	17.9355	
SIG F	.2659	.000	

the lower panel of Table 1. The lower panel of Table 1 above shows the results for the two tests of linear restrictions. The first tests the two restrictions that the coefficient estimate of CAPM is zero and that of APT is unity. The F-statistic from this test is 1.33, lower than the 5 per cent critical value of F at 2 and 211 degrees of freedom. Thus, the first joint hypothesis is not rejected. This indicates support for the APT and a rejection of CAPM. The second test also involves two linear restrictions, the first imposing a coefficient of zero on APT and the second imposing a coefficient of unity on CAPM. The results yield an F-statistic of 17.93, which is significant at the 1 per cent level. Thus, the second joint hypothesis is rejected. The results from the tests of the joint hypotheses both lead to a similar conclusion: rejection of CAPM and support for the APT. The conclusion remains unchanged even when the intercept is included in Equation (6).

CONCLUSION AND IMPLICATION

The results reported above indicate a rejection of the CAPM and an acceptance of the APT. The findings are in line with those of Chen (1983) who conducted a study on the New York Stock Exchange to compare the APT and CAPM. His results showed that the APT was preferred to the CAPM. The results are also in support of those of Burmeister and McElroy (1988) who tested both the CAPM and the APT. Their findings led them to reject the CAPM in favour of the APT. What is the implication of the results reported in this paper? One implication from the point of view of academics is that despite the attempt by Pettengil, Sundram and Mathur (1995) to resurrect it, the CAPM does not explain fully the cross-sectional variations in returns. From the point of view of practitioners, there is the implication that in forming their investment decisions, investors should bear in mind that the market index does not account fully for the variations in returns. Other factors also account for this variation and investors would do well if they took this into account. This highlights a major limitation of this study: it has not identified what the factors are in the APT model. This provides a fertile ground for fruitful research on the KLSE in the future.

ENDNOTES

1. The idea behind factor analysis is that the time series behaviour of stock returns (or indeed of any other set of large number of variables) can be decomposed into common and unique components. The common variation is explained jointly by a set of underlying, sometimes unknown, factors. This common variation is decomposed into several component parts, with each part being unique in some sense. Each part is then referred as a factor. Thus, although the factors may not be known, the factor analysis has the capability to extract data on their proxies.
2 It should be noted that the statistical package used by the authors does not require separate running of unrestricted and restricted regressions. All that is required is the estimation of the unrestricted regression followed by a test of linear restriction.

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APPENDIX 1
First Pass Regression on CAPM

STOCK	BETA	STOCK	BETA	STOCK	BETA
MLONG	0.8611	GCORP	1.5021	IJM	0.8212
ACHEM	1.5748	PILECON	0.7877	PJBHD	1.5997
PROMET	1.2623	RENONG	1.4528	SGWAY	0.8316
UE(M)	0.8680	YTL	0.8378	AISB	1.2114
ALCOM	0.6571	AMSTEEL	1.0510	AOKAM	0.7391
ASB	1.8536	MALEX	0.9206	CASH	1.7380
CCM	0.6410	CIHLDG	0.8629	CIMA	0.9267
DMIB	1.4157	ESSO	0.4138	FCW	0.8195
G'NEALY	1.2220	GOPENG	1.5016	GUH	0.3325
HEXZA	0.9596	HICOM	1.5774	HUME	0.8133
B-TEXTS	1.6052	K.JOO	0.7567	K.SENG	0.9018
KRAMAT	1.2458	LEADER	0.7935	LION	0.9039
LLB	0.4510	MAICA	1.5615	M'WATA	0.7876
MARUICH	0.6969	MCEMENT	0.9031	MUDA	1.4457
MUIB	0.6974	SEADEV	0.8498	AMCORP	1.0624
ASIAPAC	1.2582	COMMERZ	1.2265	BRIT-AM	1.0886
HLCRED	0.0976	IDRIS	1.6782	ANSAS	0.8276
K'HALL	1.2345	MAA	0.7078	MAYBANK	1.0081
MBA	0.8941	MBFCAP	1.3103	MBFHLD	1.0605
MBSB	1.2181	MGIC	1.2140	TL'GAT	0.9328
P'GKALE	1.1576	PBB	1.5033	PHILEO	1.4347
S.BANK	1.3262	UCB	1.0165	FABER	0.8764
LANDMRK	0.7795	PCHEM	1.1562	PALMCO	1.2117
PMCW	0.6655	PMI	1.3134	SEAL	1.7028
SHELL	1.3118	SITATT	1.2487	TASEK	1.0157
TONGKAH	0.5934	TRACTOR	1.5298	UAC	1.4400
SAMANDA	1.4329	AJI	0.9085	BLEISURE	0.5985
C&CBIN	1.0615	C'BERG	0.6804	CHOC	1.0670
DBABY	0.8122	DNP	1.3559	MGLASS	1.0711
FAP	1.0447	FFM	0.5199	GCOIN	0.8256
GADEK	1.3180	GUINESS	0.7597	HLIND	1.1050
KEL'MAS	0.0786	KGHLDG	0.0115	MFLOUR	0.9888
M'SHITA	0.9763	MTC	0.4800	MWE	1.1438

STOCK	BETA	STOCK	BETA	STOCK	BETA
SANYO	0.7685	ORIENT	1.0611	OYL	1.1073
PERLIS	0.9156	B-INDUS	0.8784	RJR	0.8287
ROTHM	0.6919	SETRON	1.4469	SHCHAN	1.0253
T'WINDS	1.0563	TCHONG	1.1898	BJUNTAI	2.4270
GPLUS	1.8888	KUCHAI	1.3455	MFCB	1.3288
MMC	1.1211	PTGTIN	1.6531	RAHMAN	1.8116
TRONOH	1.0219	ASIATIC	-0.0849	AUSENT	-0.0829
BKATIL	-0.1493	BKAWAN	-0.0754	BENTA	-0.1176
NBT	0.0005	C'TECK	0.0964	GHOPE	0.2589
INCHEN	-0.0629	IOI	-0.0155	KSIDIM	-0.0150
K.L.K.	-0.3016	KLUANG	0.0207	KULIM	0.1639
LINGUI	-0.1823	M'TAKAB	-0.2322	NSOP	0.4053
R'VIEW	-0.0603	SBANGAN	-0.0116	SELNUT	0.2372
TDM	-0.0265	UM'CCA	-0.3855	UTDPLT	-0.1388
WESLAND	-0.2245	ANTAH	0.2316	B'TEAD	-0.2149
B-GROUP	-0.5776	B-TOTO	0.1925	DK'MAT	-0.3677
GKENT	0.2808	GTOWN	0.0455	GENTING	-0.4122
GRANITE	-0.3469	EAC	-0.6646	JOHAN	-0.1185
K.EMAS	-0.3587	KCB	-0.8385	KKELLAS	-0.2345
MAGNUM	-0.5160	MALAKOF	-0.3476	MAS	-0.4068
MECHMAR	-0.1140	MET'PLEX	-0.5132	MISC	-0.0632
MMCE	0.2741	MOSAIC	-0.3127	MRCB	-0.1137
MULPHA	0.0969	MYCOM	-0.3226	NSTP	-0.2710
DEB	-0.2267	SDARBY	-0.3444	SJA	-0.0832
TIME	-0.0236	UNIPHON	-0.2531	MPLANT	-0.7570
AAMAL	-0.2320	AHPLNT	-0.4172	AHTIN	-0.4475
AMDB	-0.1442	APLAND	0.0184	B'RAYA	-0.0909
BOLTON	0.1327	DBHD	1.2439	E&O	-0.2756
FACB	0.1105	FIMA	-0.1103	HLPB	0.4335
IVEST	0.4126	IGB	0.4344	LSHUAT	0.9105
IS&PEN	-0.0720	KEMAYAN	0.4103	KLIH	0.6518
L&G	0.8109	LARUT	0.5035	LIENHOE	0.9076
MCBH	0.0103	MENANG	0.0444	MUMB	-0.0946
NEGARA	0.1663	P'MOUNT	0.1222	PELANGI	0.2399

(Appendix 1 - continued)

STOCK	BETA	STOCK	BETA	STOCK	BETA
PGARDEN	0.8618	KLANJUT	0.1942	SDRED	0.1299
SPROP	0.4353	S.UEP	0.4069	SMI	-0.3331
SPK	0.2516	SRIHAR	0.7948	TAIPING	0.0697
TALAM	0.0633	UMFLOUR	-0.2024	P.PERAK	-0.0637

APPENDIX 2
Second-Pass Regression Results (CAPM)

WEEK	GAMMA	WEEK	GAMMA	WEEK	GAMMA
1	0.0050	2	-0.0034	3	0.0092
4	0.0134	5	0.0097	6	-0.0084
7	-0.0220	8	0.0319	9	0.0140
10	0.0767	11	0.0646	12	0.1737
13	-0.0658	14	-0.0529	15	-0.0767
16	0.0233	17	0.0286	18	0.0013
19	-0.0460	20	-0.0212	21	-0.0157
22	-0.0317	23	0.0018	24	0.0487
25	-0.0290	26	0.0608	27	-0.0960
28	-0.0958	29	0.1546	30	0.0140
31	-0.0349	32	-0.2104	33	-0.2674
34	-0.2402	35	-0.0912	36	-0.0962
37	0.1052	38	-0.0255	39	-0.2625
40	0.0419	41	0.0437	42	0.0471
43	0.0206	44	-0.0256	45	0.1075
46	-0.0495	47	-0.0645	48	-0.0576
49	0.0200	50	0.0310	51	-0.0416
52	-0.0235	53	-0.0083		

APPENDIX 3
First Pass Regression on the APT

STOCK	BETA1	BETA2	BETA3	BETA4	BETA5	BETA6
MLONG	0.06183	0.07578	0.00879	-0.00287	-0.01374	0.02498
GCORP	0.12726	0.04312	-0.00302	0.01110	-0.03559	-0.02079
IJM	0.05912	0.02908	-0.03819	0.01849	0.00638	0.00942
ACHEM	0.10578	0.03692	-0.01451	-0.00686	0.00816	-0.00489
PILECON	0.08895	0.03510	-0.01642	-0.00761	-0.00675	0.03268
PJBHD	0.12247	0.05214	-0.00814	0.02965	-0.05828	-0.02334
PROMET	0.09844	0.07515	0.02291	-0.02731	-0.03314	-0.01561
RENONG	0.06345	0.08068	-0.01275	0.03943	-0.08055	-0.03142
SGWAY	0.05840	0.06239	-0.05703	-0.01614	-0.02200	0.00365
UE(M)	0.04739	0.05743	-0.02520	-0.00865	-0.01079	0.00144
YTL	0.06052	0.04688	-0.02640	0.00215	-0.01166	-0.01274
AISB	0.10842	0.00765	-0.03014	-0.01886	-0.00894	-0.00672
ALCOM	0.03951	0.03046	-0.02163	-0.01111	-0.01485	0.00791
AMSTEEL	0.06188	0.05001	-0.01256	0.00256	0.00923	0.00118
AOKAM	0.06814	0.04911	0.02943	-0.01857	-0.05034	0.03051
ASB	0.10390	0.04819	0.01430	0.04223	0.02014	-0.06059
MALEX	0.08861	0.03236	0.03137	0.02465	0.02554	0.02524
CASH	0.13369	0.04403	-0.03076	0.00940	-0.04748	-0.03329
CCM	0.04369	0.02361	0.00993	-0.00609	-0.00418	-0.01215
CIHLDG	0.06254	0.04208	-0.03103	0.02184	0.01679	0.01306
CIMA	0.06698	0.05711	-0.05553	-0.01345	-0.01097	0.00793
DMIB	0.12072	0.01701	-0.01739	0.01407	0.00961	-0.01204
ESSO	0.03790	0.00520	-0.00712	0.00351	0.00339	-0.00164
FCW	0.05934	0.02341	0.02075	-0.00052	0.01699	0.00448
G'NEALY	0.07739	0.03431	0.03242	0.02796	0.01015	-0.02346
GOPENG	0.09530	0.05369	-0.01045	0.02241	-0.00691	-0.00798

STOCK	BETA1	BETA2	BETA3	BETA4	BETA5	BETA6
GUH	0.11748	-0.06108	0.00335	-0.02608	-0.00756	0.04035
HEXZA	0.08592	0.05127	-0.01650	-0.01031	-0.01488	0.01180
HICOM	0.08192	0.02353	-0.00482	0.04354	0.00182	0.00381
HUME	0.04797	0.04306	-0.04055	0.00262	0.02178	-0.00014
B-TEXTS	0.10251	0.03946	-0.01705	-0.00175	0.01183	-0.00659
K.JOO	0.03921	0.03215	-0.01922	-0.02333	0.01134	0.00945
K.SENG	0.06883	0.03253	-0.00977	-0.01227	-0.00699	-0.01484
KRAMAT	0.09502	0.01252	-0.00060	0.04368	0.01634	0.01308
LEADER	0.05279	0.06124	-0.03194	-0.01497	-0.04066	0.01402
LION	0.06839	0.03130	0.01212	0.00761	0.02456	0.00541
LLB	0.03661	0.00964	0.02222	0.04260	0.01331	0.01317
MAICA	0.11510	0.03777	-0.01130	0.00438	0.00716	-0.00124
M'WATA	0.07508	0.03453	-0.04056	0.00024	0.00721	0.01895
MARUICH	0.04323	0.02853	-0.01163	0.01851	0.00104	0.00532
MCEMENT	0.04881	0.04529	-0.01805	-0.01940	0.02252	-0.00179
MUDA	0.11122	0.04578	-0.02654	-0.03214	0.00337	-0.00398
MUIB	0.06317	0.02263	-0.01197	-0.00237	0.00659	-0.00124
SEADEV	0.04857	0.06464	0.03132	-0.03678	-0.01561	0.02920
AMCORP	0.08199	0.05523	0.01936	-0.01117	-0.01292	0.00794
ASIAPAC	0.06068	0.06645	-0.02358	-0.01867	0.02103	-0.01069
COMMERZ	0.08534	0.06016	-0.01276	0.00481	-0.04278	-0.00526
BRIT-AM	0.10449	0.04550	0.01629	0.01910	-0.01388	0.00663
HLCRED	-0.00672	0.01908	-0.00104	0.01038	0.00494	-0.01399
IDRIS	0.13140	0.03238	0.01359	-0.01893	-0.00139	-0.00278
ANSAS	0.04148	0.04499	-0.00830	-0.01185	0.01753	-0.01151
K'HALL	0.10661	0.07196	-0.00477	-0.03289	-0.04824	-0.00138
MAA	0.04961	0.01362	-0.01187	0.02097	0.00409	-0.01663
MAYBANK	0.06046	0.04895	-0.00789	-0.00039	0.03239	0.02791

STOCK	BETA1	BETA2	BETA3	BETA4	BETA5	BETA6
MBA	0.07958	0.04098	-0.00656	-0.01071	-0.01083	0.03502
MBFCAP	0.09738	0.02104	-0.00594	0.03951	0.00791	0.00166
MBFHLD	0.05242	0.05752	0.01204	-0.02415	0.00143	-0.00574
MBSB	0.10107	0.06394	-0.00792	-0.02479	-0.04476	-0.00735
MGIC	0.06328	0.02497	-0.00685	0.04272	0.00893	-0.01560
TL'GAT	0.05325	0.06282	-0.00014	-0.00796	-0.00364	-0.00743
P'GKALE	0.07787	0.06287	-0.02333	0.01677	-0.04863	0.00873
PBB	0.11203	0.06716	-0.01739	0.00844	-0.06931	0.01041
PHILEO	0.12614	0.02674	-0.00686	-0.00505	-0.03863	-0.02888
S.BANK	0.10798	0.04685	0.02958	0.01681	0.00273	-0.00785
UCB	0.07091	0.06047	0.01215	-0.04314	-0.03046	-0.04077
FABER	0.05591	0.03142	-0.01748	0.02268	0.00094	-0.00808
LANDMRK	0.05986	0.03787	0.06514	-0.01507	0.02016	-0.00565
PCHEM	0.08631	0.02836	-0.00570	0.03050	-0.03437	-0.01873
PALMCO	0.08799	0.04671	-0.01719	0.00569	-0.04477	-0.02041
PMCW	0.04489	0.02637	0.01417	-0.00288	0.00889	-0.00445
PMI	0.10461	0.08593	0.00672	0.00449	0.00679	0.02627
SEAL	0.09396	0.07506	0.04879	-0.01670	0.01306	-0.01326
SHELL	0.12033	0.04998	0.03850	0.02615	-0.00373	0.01851
SITATT	0.07400	0.02619	-0.00704	0.02347	-0.00271	-0.02282
TASEK	0.08842	0.01020	0.01618	0.00159	0.01352	-0.01779
TONGKAH	0.03472	0.02229	-0.01001	0.00497	0.00260	0.01182
TRACTOR	0.11700	0.06538	-0.02211	0.01822	-0.04978	-0.02620
UAC	0.08721	0.08153	0.00472	0.01508	-0.05303	-0.02648
SAMANDA	0.09438	0.07649	-0.00174	-0.00677	-0.00612	-0.00094
AJI	0.05843	0.03486	0.03239	0.00165	0.00231	-0.00017
BLEISURE	0.04921	0.03064	0.00243	-0.01384	-0.01391	-0.00505
C&CBIN	0.05598	0.03734	-0.04145	-0.00528	0.01633	-0.01409

STOCK	BETA1	BETA2	BETA3	BETA4	BETA5	BETA6
C'BERG	0.06011	0.00628	-0.00347	-0.00748	0.00244	-0.02446
CHOC	0.08604	0.03225	-0.00897	0.02313	-0.02438	-0.02769
DBABY	0.07133	0.01413	0.03001	0.05473	0.02196	0.00883
DNP	0.10208	0.03304	0.02055	-0.01505	-0.00492	-0.01635
MGLASS	0.06451	0.04119	0.00508	0.01383	0.02908	-0.01190
FAP	0.08774	0.03461	0.02891	-0.01124	-0.00281	-0.00620
FFM	0.03529	0.00866	-0.00097	0.01425	0.00816	-0.00092
GCOIN	0.06494	0.02345	0.00950	0.00361	0.00689	-0.00573
GADEK	0.07090	0.06702	0.01844	-0.01117	0.02983	-0.00102
GUINESS	0.04894	0.01523	-0.00775	0.00284	0.01053	-0.00221
HLIND	0.04326	0.05407	-0.01350	-0.00987	0.00937	-0.01313
KEL'MAS	0.02756	0.02830	0.02143	-0.03453	-0.01728	-0.01172
KGHLDG	-0.05796	0.07115	0.00198	-0.05053	-0.00207	0.00240
MLONG	0.06183	0.07578	0.00879	-0.00287	-0.01374	0.02498
MFLOUR	0.09683	0.01890	0.02421	0.02928	0.01363	0.01697
M'SHITA	0.05866	0.03689	0.01087	-0.00017	-0.00699	-0.00585
MTC	0.04117	0.00426	-0.00343	0.00358	0.00609	-0.00320
MWE	0.07599	0.04136	-0.01970	0.00951	0.00312	0.00366
SANYO	0.07459	0.04162	0.04391	0.04280	0.00825	0.02851
ORIENT	0.04685	0.03948	-0.02136	0.00553	0.01147	-0.00199
OYL	0.06786	0.03158	-0.02431	0.00633	0.00220	0.00003
PERLIS	0.06368	0.01174	-0.01396	0.01437	0.01149	-0.00915
B-INDUS	0.07795	0.05131	-0.00783	-0.02760	-0.01841	-0.00561
RJR	0.05417	-0.00405	-0.00822	0.02353	0.00336	-0.01467
ROTHM	0.04108	0.01240	-0.00820	0.00074	0.00796	-0.00962
SETRON	0.12620	0.05836	-0.00323	0.00012	0.02286	0.01804
SHCHAN	0.07618	0.01982	0.00808	0.00525	-0.01983	-0.00167
T'WINDS	0.08634	0.02464	-0.01759	0.02511	-0.00422	-0.01187

STOCK	BETA1	BETA2	BETA3	BETA4	BETA5	BETA6
TCHONG	0.06995	0.02574	-0.02752	-0.00066	0.02750	-0.00753
BJUNTAI	0.15312	0.05520	0.04445	0.02896	0.01775	-0.03607
GPLUS	0.12907	0.06578	-0.02668	0.01614	-0.02642	-0.02175
KUCHAI	0.07717	0.06412	0.05130	-0.01778	0.00222	-0.00378
MFCB	0.10792	0.01100	0.03378	-0.00487	0.00762	-0.02993
MMC	0.07353	0.03050	-0.00074	-0.00932	0.00341	-0.01037
PTGTIN	0.11123	0.01635	0.01084	0.03773	0.02897	0.00329
RAHMAN	0.13085	0.03723	0.04278	0.07212	0.02155	0.00183
TRONOH	0.06605	0.04212	0.02588	0.00126	0.01963	0.00824
ASIATIC	-0.05182	0.07493	-0.01359	-0.00631	-0.00044	0.02903
AUSENT	-0.04014	0.03315	0.00218	-0.01096	0.00178	0.00459
BKATIL	-0.05186	0.09573	-0.01892	0.01782	-0.00316	-0.01572
BKAWAN	-0.07437	0.06072	0.00489	-0.00603	-0.02660	0.07543
BENTA	-0.05328	0.07236	0.00986	0.00824	0.01377	0.00724
NBT	-0.03833	0.05258	-0.01327	-0.00629	0.00363	0.02389
C'TECK	-0.05916	0.09497	-0.00273	0.03338	0.02180	0.03359
GHOPE	-0.02872	0.05741	-0.00689	-0.00792	0.01428	0.00695
INCHEN	-0.07927	0.12118	-0.01303	-0.01324	-0.02295	-0.01146
IOI	-0.02398	0.04734	0.00275	-0.02524	0.01918	-0.00388
KSIDIM	-0.05043	0.09124	-0.01240	0.02889	-0.01169	-0.02250
K.L.K.	-0.04244	0.08991	-0.01701	0.00883	-0.02857	0.00581
KLUANG	-0.03418	0.08763	-0.00610	0.04641	-0.04431	-0.04209
KULIM	-0.04221	0.09371	-0.01752	0.02289	-0.02361	-0.01355
LINGUI	-0.04053	0.05295	-0.00080	0.01087	-0.01212	0.00675
M'TAKAB	-0.04880	0.04702	-0.00751	0.01049	-0.00653	0.01054
NSOP	-0.02481	0.03962	0.01114	-0.02923	0.01979	-0.02246
R'VIEW	-0.06613	0.07982	-0.00097	-0.01259	-0.00558	0.03368
SBANGAN	-0.04990	0.08285	-0.01004	0.03352	0.00589	-0.00020

STOCK	BETA1	BETA2	BETA3	BETA4	BETA5	BETA6
SELNUT	-0.00564	0.03408	-0.00098	-0.00667	0.00804	0.00163
TDM	-0.03435	0.02735	-0.02674	-0.08406	-0.01485	0.01091
UM'CCA	-0.05915	0.09904	-0.00146	0.01672	0.00653	0.00679
UTDPLT	-0.04892	0.09053	-0.04385	0.00418	-0.01340	0.01132
WESLAND	-0.06774	0.10392	0.01406	0.02799	-0.03337	-0.03513
ANTAH	-0.05714	0.06725	0.00848	-0.00877	0.03167	-0.00841
B'TEAD	-0.03334	0.05427	-0.00663	0.00690	-0.00091	-0.02473
B-GROUP	-0.06346	0.07734	0.02081	0.00842	-0.02044	0.00508
B-TOTO	-0.02703	0.02590	-0.00195	0.00199	0.00672	0.00217
DK'MAT	-0.03995	0.10009	-0.09091	-0.05546	0.01547	0.08327
GKENT	-0.03107	0.09379	-0.05043	-0.01055	0.06039	0.00399
GTOWN	-0.03604	0.06966	0.00129	-0.00375	0.00804	0.01164
GENTING	-0.06987	0.08045	-0.00137	0.02462	-0.01376	-0.02661
GRANITE	-0.03800	0.06495	-0.02481	0.01053	-0.01025	0.00747
EAC	-0.04577	0.08158	0.03163	-0.04189	-0.01575	-0.00632
JOHAN	-0.05230	0.04829	0.02573	-0.03299	0.00967	0.00184
K.EMAS	-0.03755	0.03314	0.00493	-0.01134	0.01515	0.01025
KCB	-0.04316	0.06909	-0.00152	0.03157	-0.01497	0.00173
KKELLAS	-0.03213	0.08792	0.00534	-0.04038	-0.01089	-0.00807
MAGNUM	-0.05738	0.05136	0.01361	-0.03646	-0.01054	-0.00273
MALAKOF	-0.04907	0.02696	0.01332	-0.00133	0.01114	-0.00617
MAS	-0.03681	0.03749	0.02442	-0.02734	0.00931	0.00445
MECHMAR	-0.03669	0.08261	0.00056	0.03890	-0.00945	-0.02254
MET'PLEX	-0.04903	0.07422	0.00882	-0.01402	-0.01001	0.02627
MISC	-0.04586	0.01376	0.00718	-0.00017	0.03221	-0.01167
MMCE	-0.01681	0.05401	0.00935	0.02304	0.00384	0.04056
MOSAIC	-0.05785	0.05109	0.00115	0.00535	-0.00429	0.00964
MRCB	-0.02164	0.14582	0.05152	-0.01250	0.00197	0.00161

STOCK	BETA1	BETA2	BETA3	BETA4	BETA5	BETA6
MULPHA	-0.06103	0.18146	0.05081	0.04898	0.00000	0.07847
MYCOM	-0.04655	0.06326	-0.00216	-0.02965	-0.00587	0.01042
NSTP	-0.05805	0.07402	0.04190	-0.06619	0.00178	-0.00520
DEB	-0.01646	0.05088	0.01043	0.01726	-0.00426	0.02400
SDARBY	-0.04671	0.07428	0.02071	0.00603	0.00656	0.00703
SJA	-0.04320	0.10227	0.00047	0.02022	-0.01998	0.01782
TIME	-0.03069	0.07052	0.02560	0.00814	0.01589	0.00998
UNIPHON	-0.02836	0.03144	0.00132	0.02689	0.01285	-0.00878
MPLANT	-0.06608	0.13802	0.02796	0.08478	-0.01439	0.00629
AAMAL	-0.09886	0.05040	-0.00339	-0.01240	0.02748	0.01413
AHPLNT	-0.00442	0.05405	-0.00047	0.03626	0.01581	0.04630
AHTIN	-0.06855	0.07357	0.04259	-0.00802	-0.00934	0.00440
AMDB	-0.04372	0.06496	-0.01176	0.03527	-0.01712	-0.01198
APLAND	-0.04067	0.09125	-0.02965	0.07388	-0.02147	-0.00910
B'RAYA	-0.05973	0.09852	0.00125	-0.00520	0.01123	-0.03193
BOLTON	-0.06146	0.07866	0.00085	0.02584	0.01250	0.01385
DBHD	-0.03618	0.16740	0.05203	-0.07723	0.00151	-0.05463
E&O	-0.07912	0.07716	-0.01507	-0.00280	0.01175	0.03289
FACB	-0.05528	0.07996	-0.02027	0.03246	-0.02333	0.00412
FIMA	-0.04216	0.04180	-0.00855	-0.02558	0.00762	0.00940
HLPB	-0.04472	0.11814	-0.02188	0.03809	-0.02430	0.00173
IVEST	-0.04524	0.11688	0.01265	0.01353	-0.01571	-0.01889
IGB	-0.04246	0.06933	0.00538	0.01220	0.02070	0.00441
LSHUAT	-0.03806	0.12124	0.06088	-0.00380	0.02419	-0.03426
IS&PEN	-0.04430	0.04809	0.00508	0.00665	0.00466	0.00473
KEMAYAN	-0.04896	0.11255	-0.01790	0.01146	0.01260	0.01156
KLIH	-0.02937	0.10997	-0.01531	0.06753	-0.02971	-0.02872
L&G	-0.01322	0.06190	-0.02427	-0.00089	0.04976	0.01936

STOCK	BETA1	BETA2	BETA3	BETA4	BETA5	BETA6
LARUT	-0.05985	0.11497	-0.01180	0.00409	0.05101	0.01172
LIENHOE	-0.03116	0.12022	0.00813	0.00362	-0.01833	-0.03893
MCBH	-0.05222	0.09303	-0.02163	0.03163	-0.05232	-0.01453
MENANG	-0.06553	0.10115	-0.00185	0.01916	-0.01374	0.01052
MUMB	-0.07541	0.08451	-0.02209	-0.00043	-0.00769	0.00129
NEGARA	-0.00839	0.03314	0.00328	0.00212	0.00710	-0.00524
P'MOUNT	-0.06089	0.10832	0.02684	-0.00080	-0.01492	-0.00800
PELANGI	-0.04751	0.07735	-0.00537	0.00114	0.03188	0.00739
PGARDEN	-0.03065	0.10236	-0.01049	0.02178	0.01230	-0.01896
KLANJUT	-0.05312	0.10306	-0.01005	-0.00700	0.00936	0.01346
SDRED	-0.05996	0.07338	0.00728	0.02974	-0.01157	-0.00874
SPROP	-0.03969	0.08069	-0.01144	0.01886	0.01143	-0.01172
S.UEP	-0.02486	0.05796	-0.01129	-0.00565	0.03015	0.01908
SMI	-0.07751	0.03221	0.00519	0.02987	0.00230	0.01055
SPK	-0.05766	0.12413	0.00749	-0.01009	-0.02678	0.01031
SRIHAR	-0.04533	0.11218	-0.00967	0.07600	-0.05491	-0.02812
TAIPING	-0.05012	0.06339	-0.01272	-0.01463	0.00874	0.01030
TALAM	-0.05497	0.07441	0.01687	-0.01346	0.02580	0.04646
UMFLOUR	-0.03827	0.05551	0.02156	-0.03712	0.01083	0.03108
P.PERAK	-0.01369	0.04085	0.02256	-0.00216	0.00609	0.01843

APPENDIX 4
Second Pass Regreesion on the APT

WEEK	GAMMA1	GAMMA2	GAMMA3	GAMMA4	GAMMA5	GAMMA6
1	0.03165	-0.00571	-0.02065	-0.00687	0.00527	-0.00267
2	-0.01998	-0.01216	-0.01462	0.00476	-0.01064	-0.00406
3	0.02297	-0.01162	0.00457	0.00458	0.03732	0.03130
4	0.04081	0.03739	-0.02455	-0.01317	-0.01082	0.00050
5	0.00683	-0.00382	0.00550	-0.04446	0.00291	-0.01621
6	-0.01872	0.02538	-0.02741	0.03551	0.02624	0.00418
7	0.02107	0.03941	-0.02478	-0.01036	0.04342	0.02346
8	-0.06421	-0.08636	0.01515	0.04855	-0.04510	-0.01590
9	-0.02357	-0.00113	0.00542	-0.02687	-0.04625	-0.03294
10	0.20257	-0.03321	0.03369	0.00218	0.06123	0.04858
11	0.20492	0.02756	-0.00523	-0.01919	0.01235	0.01057
12	0.40926	-0.06980	-0.02420	-0.01057	0.02081	0.02450
13	-0.11226	0.05303	-0.00486	-0.00541	0.01452	0.02659
14	-0.13394	-0.00953	-0.01062	0.00004	0.00994	-0.01117
15	-0.26859	0.01807	-0.03017	0.02578	-0.03189	-0.03797
16	0.11604	0.01404	0.01054	-0.03023	0.00323	0.03919
17	0.03422	-0.07199	0.01929	-0.08531	0.03508	0.01638
18	0.02934	-0.00232	-0.01157	-0.00102	-0.01525	-0.00633
19	-0.06917	0.04316	-0.00837	0.00186	-0.00322	-0.00444
20	-0.02545	0.01826	0.01376	-0.01298	-0.00876	-0.00623
21	-0.00581	0.01846	-0.01068	0.02272	0.03545	0.01943
22	-0.03900	0.00812	0.00701	0.02552	-0.00309	0.01411
23	0.03307	0.00987	0.01614	-0.01064	0.01648	0.00481
24	0.17659	0.03357	0.00977	-0.02430	0.00928	0.00556
25	-0.04277	0.05721	-0.06202	0.01894	-0.00865	-0.01753

WEEK	GAMMA1	GAMMA2	GAMMA3	GAMMA4	GAMMA5	GAMMA6
26	0.18475	0.01578	0.01562	-0.00505	0.00218	0.04441
27	-0.28690	0.00027	-0.02369	0.05802	0.01289	-0.05216
28	-0.20435	0.10166	-0.01247	0.06907	-0.07274	-0.02000
29	0.29263	-0.11922	-0.01240	-0.07613	-0.03360	0.07142
30	0.03222	-0.01781	-0.07538	-0.09055	-0.00365	-0.00975
31	-0.02506	0.12828	0.06650	-0.02976	-0.00074	0.06480
32	-0.38432	0.13875	0.05233	-0.00442	-0.02099	0.04861
33	-0.61710	0.08037	-0.01710	0.00730	-0.01869	-0.09394
34	-0.37781	0.18496	0.00461	-0.02313	0.02993	-0.01075
35	-0.19610	-0.01989	0.01095	-0.02424	0.00025	-0.03448
36	-0.16218	0.08449	0.08251	-0.06482	0.00358	0.02608
37	0.22630	-0.03824	0.00595	0.01504	0.02473	0.03515
38	-0.05133	-0.01370	0.00194	0.00103	0.00859	-0.00123
39	-0.67080	-0.07225	0.14167	0.13557	-0.08604	0.07910
40	0.05319	-0.07841	-0.04894	-0.02090	0.02163	-0.00059
41	0.14216	0.01393	0.05257	-0.00267	0.01549	0.03654
42	0.09251	-0.05013	0.00308	-0.01916	-0.00392	0.01795
43	0.09919	0.01787	-0.00904	-0.01253	0.02364	0.02222
44	-0.07731	0.00971	-0.03105	-0.02358	-0.04082	0.01016
45	0.16801	-0.04089	0.02378	-0.01434	-0.03322	0.00362
46	-0.10443	-0.01991	-0.00638	-0.00770	0.00285	0.03420
47	-0.12156	0.05575	-0.00333	-0.00996	0.03514	-0.02111
48	-0.12222	0.02613	-0.00525	-0.02359	-0.00044	0.00137
49	0.04282	-0.00436	-0.00297	-0.00812	0.00611	0.01943
50	0.06648	-0.01896	0.00198	0.00364	-0.00677	-0.02085
51	-0.08962	0.02209	0.02776	0.00433	-0.01476	-0.01800
52	0.01292	0.05051	0.03000	0.00635	0.03607	-0.03538
53	-0.03463	-0.00481	0.00485	-0.00029	0.02622	-0.01504