The Stock Exchange of Suriname: Returns, Volatility, Correlations and Weak-form Efficiency

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Abstract

The empirical properties of stock returns are studied for 10 companies listed at the Suriname Stock Exchange (SSE), which is a young and growing stock market. Individual stock returns are found to be predictable from the own past to some extent, but the equal-weighted index returns are not. Dynamic correlations with large Latin-American stock markets appear to be zero. It is concluded that there is much more efficiency to be gained for the SSE.

Key words: Emerging markets; Developing countries; Returns; Volatility; Market Weak-form Efficiency
JEL Code: G15; G14

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1. Introduction

Stock markets can signal economic growth, and for many industrialized countries stock market returns provide some predictability for future economic performance, Barro (1990), Fama (1981), and Fisher and Merton (1984), amongst others. It is important that stock markets operate efficiently as efficiency is essential for proper wealth distribution and asset allocation to the most productive investments. In assessing stock market efficiency, three levels of efficiency are recognized and for this study we will focus on weak-form efficiency (which is the lowest level of efficiency). Weak-form market efficiency (or informational efficiency) is conventionally defined as that future stock returns are not predictable from current and past returns (see Samuels, et al. 1981, Malkiel 2001, and Robinson 2005 for similar approaches). Market participants cannot thus be granted the opportunity of earning excessive returns on a consistent basis by analyzing past prices.

For developing countries the positive impact of proper stock markets can be viewed as being even more important as such countries seek to catch up with worldwide economic growth. When their stock markets would be weak-form efficient, it would attract international investors which may boost economic prosperity. Stock prices would reasonably provide an indication for the optimal allocation of resources. Hence, for emerging economies it is even more relevant to have a weak-form efficient stock market. Seddighi and Naian (2004) and Magnusson and Wydick (2002) provide a recent empirical overview of the efficiency of China's and Africa's stock markets, while Watson (2009) analyzes the efficiency of stock markets in the CARICOM sub-region. Other exemplary studies which focus on the efficiency of stock markets in emerging economies are Claessens, et al. (1995), Butler and Malaikah (1992) and Urrutia (1995).

In this paper we address the weak-form efficiency of the stock market of Suriname, an emerging stock market, which has never been analyzed as such. A main reason for this omission might be that the returns data have to be manually collected and coded, a task that took us a few weeks. In evaluating weak-form efficiency, researchers have concentrated on statistical tests for predictable patterns in stock returns.

The Suriname Stock Exchange (SSE) has a few peculiar properties, and we discuss these in this paper. The SSE was established in 1994 and from that year onwards 10 Surinamese listed companies began the trading of their shares. At the end of 2012, the shares of 11 companies are

actively traded with the larger part belonging to the manufacturing sector, of which 10 ever since 2003 for which we can obtain consecutive time series data.

We examine the empirical properties of these 10 listed stocks on the Suriname Stock Exchange and we also produce what tentatively can be called a stock market index, which is simply the equally weighted sum of the 10 individual returns. We use equal weights instead of market values-based weights as it turns out that not all annual reports of these companies for these years are available. We discuss the properties of the returns, of the volatility and we also consider potential correlations between the individual stock returns. Next, we test for weak-form efficiency and we correlate the SSE index with various other Latin-American stock markets.

The outline of the paper is as follows. In Section 2 we give a brief description of the Suriname Stock Exchange. In Section 3 we examine the properties of the returns data, and we also test for weak-form efficiency. In Section 4 we conclude with a discussion.

2. The Suriname Stock Exchange (SSE)

Suriname is a country in South America, with French Guyana and Guyana as neighboring countries to the west and east, and in the south it borders Brazil. The country is sized 163.000 squared kilometers, which is about one-third of Spain. In contrast, Suriname has only about 500.000 inhabitants, which is about one-hundredth of Spain. Until 1975 Suriname used to be a colony of the Netherlands. In recent years, Suriname has benefited from high commodity prices and still continues to do so. This is stimulated by strong activity in the oil, bauxite and gold sectors, as well as in public investment. GDP per capita has grown from US$ 2,610 in 2003 to US$ 8,864 in 2012. However, up till now the SSE has not been fully considered as an option to propel economic growth. In Figure 1 we present the GDP per capita for Suriname for the period 2003-2012. Figure 2 presents the course of the exchange rates for Suriname with regard to the US dollar and the Euro for the period 2003-2012 and Figure 3 provides the import and export figures of Suriname.

The Stock Exchange

The Suriname Stock Exchange (SSE) is located in Paramaribo, the capital of Suriname. It was established in January 1994 and it started out as an initiative from a group of private sector companies. At present, the SSE still has no legal basis and it is self-regulating. A shortcoming is the absence of a Securities Exchange Act. The exchange is open for trading two times per month on Thursday using a manual trading system. The outcome of a trading session is presented in an exchange report (bulletin). There is no central clearing and settlement system. The criteria for admission which are determined by the Board of SSE are stated in the Exchange regulations (SSE 2007d). These are the size of the securities packages which are available for free trade which should be revealed, the disclosure of audited financial statements and the financial position of the issuer.

From 2003 to 2011, there is no considerable change in the number of companies listed on the SSE and low volumes of shares are traded. Nonetheless, the total market capitalization has grown from approximately 145 million SRD at the end of 2003 to 1.29 billion SRD by 2011. In Appendix A we provide information about the SSE listed companies. In Appendix B we provide information of the development of the SSE based on the indicators size and liquidity as reported by Craigwell and Alleyne (2004).

Comparison of SSE with Caribbean stock exchanges

The three major stock exchanges in the Caribbean region are the Jamaica Stock Exchange (JSE), Trinidad and Tobago Stock Exchange (TTSE) and the Barbados Stock Exchange (BSE). According to Watson (2008), these exchanges have all been characterized as inefficient, underdeveloped and illiquid with only a few listed companies. The SSE has a number of characteristics which are rather similar to these stock exchanges.

First of all, and not unexpectedly, the SSE is rather small which can be derived from the relatively limited trading activity and from the small number of listed companies. Details are presented at http://www.surinamestockexchange.com/nl. A second feature of the SSE is that it is privately owned and is managed by a Board mainly consisting of corporate players of listed companies. Third, the availability of information of the SSE is good, in the sense that information on past prices is available starting from 2003. That is, the half-monthly reports are partially available through the website. However, for the proper functioning of the SSE, more

reliable and easily accessible (financial) information should be provided. Furthermore, only a few brokers are active on the market, that is, only brokers who are admitted by the Board are allowed to participate on the exchange on behalf of their clients.

In sum, the way the prices are set suggests that there is some level of illiquidity in the market, and that there are no designated market traders. Further, trades occur only twice a month and there are low volumes of such trades. Therefore, it seems that the SSE is operationally inefficient. The consequences of the inefficiency for the empirical data are studied below.

3. Data

The data used to examine the weak-form efficiency of the SSE comprises of the closing stock prices of 10 companies listed on the SSE for which consecutive time series data is obtained over the period January 2003 to December 2011. We manually collected the data for the stock returns from the half-monthly reports which to a large extent were obtained from the exchange afterwards. In Appendix C we present an excerpt of the raw data that is available to us, where it is also visible that it can happen that prices move from, for example, 1.07 to 10.70 (more on this below). In Appendix D we present the actual days for which we have price information. In practice, primarily company shares are traded on the SSE.

Table 1 summarizes the listed companies and presents an ID number for each of them which are relevant for the presentation of the results below.

Returns and volatility

The data for the stock returns from the published half-monthly reports contain 24 observations per year, approximately 2 per month. We analyze the data for 2003 to and including 2011, which gives 216 data points. We use the last observation of 2002 to create the first returns observations for 2003. This database includes full information on the 10 listed companies of interest, so we can also look at correlations across the returns.

Before we perform various computations, we first carefully look at the data in the sense that we take care of re-alignments of stock prices. For example, Assuria's stock price witnessed large changes in the level of the stock price on days 58, 82 and 93, see Figure 4. On these days

the returns take huge values. For parts of our analysis we decide to replace these exceptional returns by 0, and as such create corrected series (using the acronym _C). Note that for some analyses below we also consider the raw returns data including these outliers. We carry out such corrections for the data for the Surinam Bank, Elgawa, Hakrinbank and Self Reliance. We actively sought for explanations for these large returns, but we could not retrieve any useful information on this matter.

Nominal Returns

Table 2 presents some summary statistics of the data, and it is clear that negative returns are rare, and that there are many returns with value 0. The zero returns data are not missing data, although they can be associated with no trade. Some series have only a few re-alignments, and then the returns have been set equal to zero for some analyses. Otherwise, it can also be that zero returns are apparently the actual output of the meeting of the traders. In the first column we see that average returns (with all zeroes included) range from 0.21% to 1.30%. The third column shows that the number of cases with only positive returns ranges from 11 (VSH Foods) to 98 (The Surinam Bank). When we compute the average returns only for the cases when these returns are positive, we obtain mean returns ranging from 2.64% (Torarica) to 6.22% (Elgawa). As compared with international stock market returns, these values seem to be rather modest.

Figure 5 presents an approximate index for the SSE. We created this index by summing the 10 returns, where we thus assumed equal weights. The number of zero returns in the index is 17, and these zeroes do not appear in sequences but are all isolated observations. The creation of a market-value weighted index involves the collection of the market values. Although we do have access to various annual reports, we did not manage to collect them all, also as some companies did not have these in various years. We therefore stick to the analysis of an equally weighted index. Figure 6 presents a 24-period moving average of this index, which shows some cyclical patterns, with peaks in 2005 and 2008 and a recent dip in 2010. The average value of the index is 0.080% and the median is 0.069%. This suggests that the stock market did not substantially increase nor decrease in the period of 2003 to 2011.

Real Returns

In the relevant appendix E we present the monthly inflation data. We use the inflation data to create real stock returns, where monthly inflation figures are used twice for the pairs of data that correspond with the relevant months. Figure 7 displays the inflation data, and we can see that monthly inflation can be quite large, sometimes close to 5%.

Table 3 gives a statistical summary of the real returns. On average, the real returns for 6 stocks are negative, with VSH foods having the most negative average (-0.827%). The amount of zeroes in the real returns is zero. The best performing stock is that of the Surinam Brewery with an average real return of 0.258%.

Correlations

Next, we consider the correlations between the returns of the 10 stocks. As there are many returns that are equal to 0, we decide to resort to a simple counting method. In Table 4 we give the number of times that the returns of pairs of stocks are both positive. On the diagonal one finds the number of positive returns of each stock itself, and the off-diagonal cases give the similarity of stock returns.

To visualize the numbers in Table 4, we use basic correspondence analysis (Greenacre, 2007). The results are given in Figure 8. Stock returns R4 (Elgawa) and R7 (Self Reliance) have large distances to the main cloud of points concerning stock returns R1, R3, R5, R8 and R10. So, Assuria, the Surinam Bank, Hakrinbank, the Surinam Brewery and Varossieau show similar behavior, that is, their stock prices move up often jointly, at least if they move up.

Table 5 presents similar numbers, but now concerning the data when pairs of stock returns are zero at the same time. This happens quite frequently as can be seen from the large numbers. Figure 9 visualizes these correlations, and now we see that Assuria (1) and the Surinam Bank (3) behave very different from the other 8 stocks.

In sum, despite some marked differences concerning a few stocks, the tables and graphs for correlations show that there are quite some similarities across stock returns. This also supports our approach of taking an equal weighted average as an approximate index.

Volatility

In Table 6 we report the estimates of the relevant parameters in a GARCH (1,1) model (see Franses, 1998, Chapter 7, and the many references therein) for the two index series (with and without outlier removal). Such a GARCH model can be viewed as rather unreliable for data with many zeroes, so we do not consider this model for the individual series.

The estimation results in Table 6 suggest that equal-weighted stock index returns for the Suriname Stock Exchange have quite similar properties as those listed at USA or European stock markets. The parameters are estimated to be equal to 0.16 (ARCH) and 0.81 (GARCH), respectively. Also for the index compiled from the raw data we get similar estimates.

Weak-form efficiency

Finally, we examine whether the SSE is weak-form efficient. First we consider the individual stocks, and lastly we look at the (approximate) index.

Table 7 presents the estimated p values of an F test on the joint significance of 5 lags in an autoregression of order 5. When the p value is small, for example, below 0.05, we find evidence that individual stock returns can be predicted from their own past. The bold face cases in Table 7 are concerned with such predictability, that is, the returns of CIC, Elgawa, Hakrinbank, VSH foods and Varossieau are to some extent predictable. Such predictability disappears for CIC and Elgawa when we only consider the cases with positive returns.

Most importantly, when we consider our equal-weighted stock market index for the SSE, we see that this index is not predictable.

Relation with other Latin American stock markets

For the same years (2003-2011) we have collected daily data on the stock markets of Brazil, Chile, Mexico and Peru. We use only those days that correspond with the days presented in Appendix C. Table 8 present the leads (SSE leads other markets) and lags (SSE follows) correlations. Basically, we observe that there are no significant cross correlations between the SSE and other stock markets. This is quite intriguing as the four Latin American stock markets do have positive cross correlations among each other (not reported). In sum, there is no relation between the stock market in Suriname and other important stock markets in the region.

4. Conclusion

In this paper we provided the first ever quantitative analysis of the stock returns of companies listed at the Suriname Stock Exchange. We documented that average returns over the years 2003 to and including 2011 are not high, and that inflation-corrected returns are often negative, on average across these years. We showed that stock returns patterns across the 10 stocks have similar behavior in various dimensions, and that estimates of conditional volatility parameters for the index bear similarities with index returns in developed countries. One conclusion of our study is thus that the SSE index shows some signs of weak-form efficiency. However, the way the prices are set indicates some level of illiquidity in the market. Further, there are no designated market traders, and trades occur on average only twice a month with low volumes of such trades. But, even though the SSE is operationally inefficient, the time series properties of the index mimic those that are usually found in other stock markets. In sum, we conclude that there still is much more efficiency to be gained for the SSE.

This paper involved rather basic empirical analysis, but in our future work we plan to zoom into more detailed features of the SSE. One important issue is whether announcements made by the respective firms have an impact on returns and volatility. Also, we would like to examine if stock returns have predictive content for future economic growth.

Tables

Table 1: Listed companies

ID	Company	Sector, industry
R1	Assuria Ltd.	Insurance
R2	Consolidated Industries Corporation Ltd.	Manufacturing
R3	The Surinam Bank	Banking
R4	Elgawa Ltd.	Services and Trading
R5	Hakrinbank Ltd.	Banking
R6	VSH Foods	Manufacturing
R7	The Surinam Insurance Company Ltd.	Insurance
R8	The Surinam Brewery	Manufacturing
R9	The Torarica Group of Hotels	Services
R10	Varossieau Coating Industries	Manufacturing

Table 2: Statistical summary of all returns in percentages (216 observations) and of the cases where the returns are positive

	All cases		Cases with positive returns		
	Mean	Median	Sample size	Mean	Median
Assuria	1.14	0.00	93	2.65	2.02
CIC	0.74	0.00	29	5.60	3.51
DSB	1.16	0.00	98	2.98	2.31
Elgawa	1.07	0.00	37	6.22	6.06
Hakrinbank	0.61	0.00	57	2.78	2.28
VSH Foods	0.21	0.00	11	4.14	3.92
Self Reliance	0.59	0.00	34	5.85	5.13
Surinam Brewery	1.30	0.00	76	3.69	2.00
Torarica	0.59	0.00	48	2.64	1.35
Varossieau	0.60	0.00	34	3.82	2.50

Table 3: Statistical summary of all real returns (216 observations), that is, returns after correction for inflation

	Mean	Median
Assuria	0.102	-0.395
CIC	-0.302	-0.450
DSB	0.125	-0.270
Elgawa	0.027	-0.410
Hakrinbank	-0.431	-0.410
VSH Foods	-0.827	-0.580
Self Reliance	-0.452	-0.550
Surinam Brewery	0.258	-0.390
Torarica	-0.452	-0.424
Varossieau	-0.437	-0.450

Table 4: Number of times (out of 216 cases) that the returns of stock *a* and of stock *b* are both **positive**. For example, in row 2 column 3 we see that there are 11 observations where CIC (R2) and the Surinam Bank (R3) have positive returns.

Assuria	93	9	51	22	24	4	7	36	26	17
CIC	9	29	11	0	7	3	8	11	6	4
DSB	51	11	98	16	28	7	12	36	25	17
Elgawa	22	0	16	37	13	0	2	17	3	9
Hakrinbank	24	7	28	13	57	9	12	25	16	12
VSH Foods	4	3	7	0	9	11	3	3	6	3
Self Reliance	7	8	12	2	12	3	33	10	6	3
Surinam Brewery	36	11	36	17	25	3	10	76	23	14
Torarica	26	6	25	3	16	6	6	23	48	8
Varossieau	17	4	17	9	12	3	3	14	8	34

Table 5: Number of times (out of 216 cases) that the returns of stock *a* and of stock *b* are both **zero**. For example, in row 2 column 3 we see that there are 98 observations where CIC (R2) and the Surinam Bank (R3) have zero returns.

Assuria	123	102	75	108	89	116	91	83	101	106
CIC	102	186	98	149	134	178	154	121	144	156
DSB	75	98	117	95	87	113	90	77	94	101
Elgawa	108	149	95	179	133	168	137	120	134	154
Hakrinbank	89	134	87	133	157	155	128	106	125	135
VSH Foods	116	178	113	168	155	205	166	132	163	174
Self Reliance	91	154	90	137	128	166	172	111	136	142
Suriname Brewery	83	121	77	120	106	132	111	140	115	120
Torarica	101	144	94	134	125	163	136	115	168	142
Varossieau	106	156	101	154	135	174	142	120	142	182

Table 6: Estimates of parameters in GARCH models for SSE index returns (with standard errors in parentheses). The AR order is given in brackets.

	ARCH parameter	GARCH parameter
Index, after correction [0]	0.162 (0.043)	0.809 (0.039)
Index [0]	0.072 (0.010)	0.860 (0.018)

Table 7: Tests for efficiency (p values of the F test for the joint significance of five lags in an autoregression of order 5). We consider all data and only those cases where stock returns are positive.

	All cases	Cases with positive returns
Assuria	0.110	0.601
CIC	**0.000**	0.374
DSB	0.593	0.096
Elgawa	**0.000**	0.672
Hakrinbank	**0.000**	**0.000**
VSH Foods	**0.005**	**0.017**
Self Reliance	0.474	0.236
Surinam Brewery	0.806	0.780
Torarica	0.220	0.349
Varossieau	**0.000**	**0.002**
Index	0.160	0.152

Table 8: Correlations between SSE equally weighted returns and other Latin American stock returns (Sample size is 216, meaning that correlations < -0.136 and > 0.136 are significant at the 5% level, indicated with an *)

	Leads				
	0	+1	+2	+3	+4
Brazil	0.069	0.022	0.025	0.011	-0.045
Chile	-0.063	-0.039	0.036	0.081	-0.111
Mexico	0.094	0.061	-0.058	0.016	-0.062
Peru	-0.002	0.048	-0.015	0.020	-0.139*
	Lags				
	-1	-2	-3	-4	-5
Brazil	0.008	-0.015	-0.012	-0.067	-0.049
Chile	-0.024	0.032	-0.048	-0.168*	0.006
Mexico	-0.019	-0.019	-0.076	-0.025	-0.072
Peru	0.036	0.009	0.000	-0.070	0.049

Figures

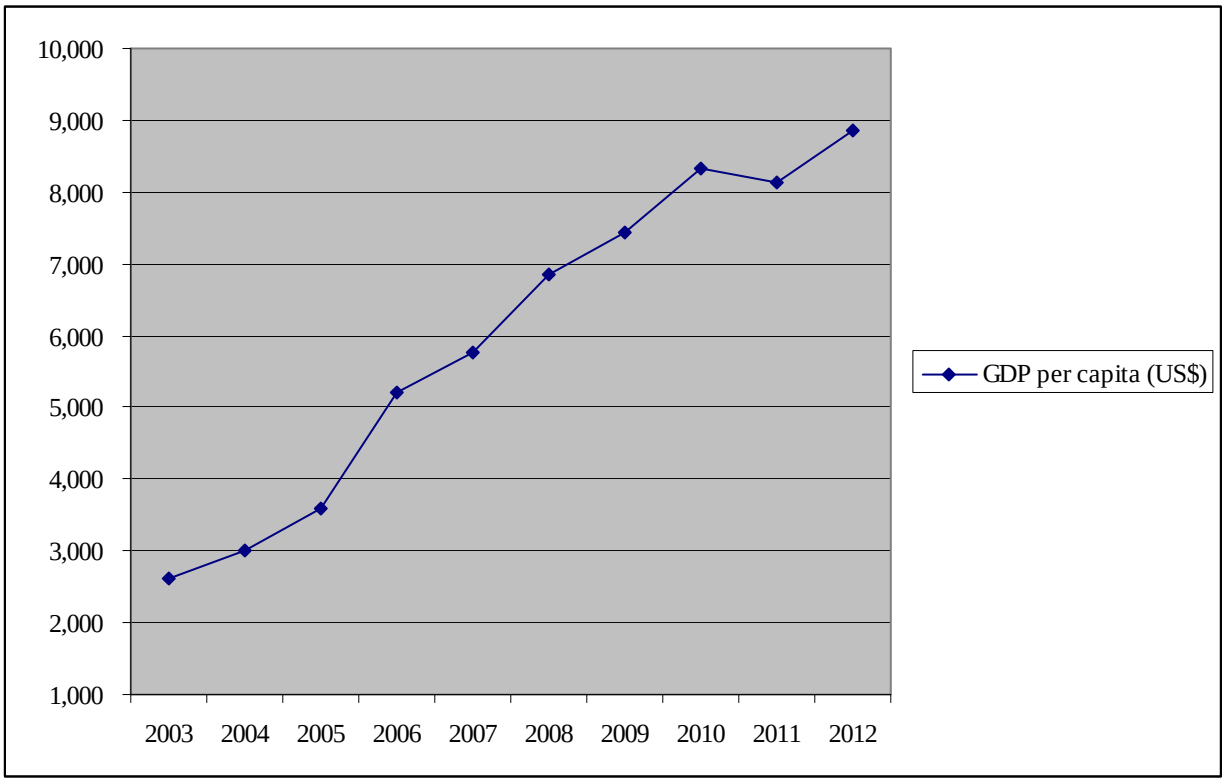

Figure 1: GDP per capita Suriname at current prices for the period 2003-2012.
Source: the World Bank (www. worldbank.org)

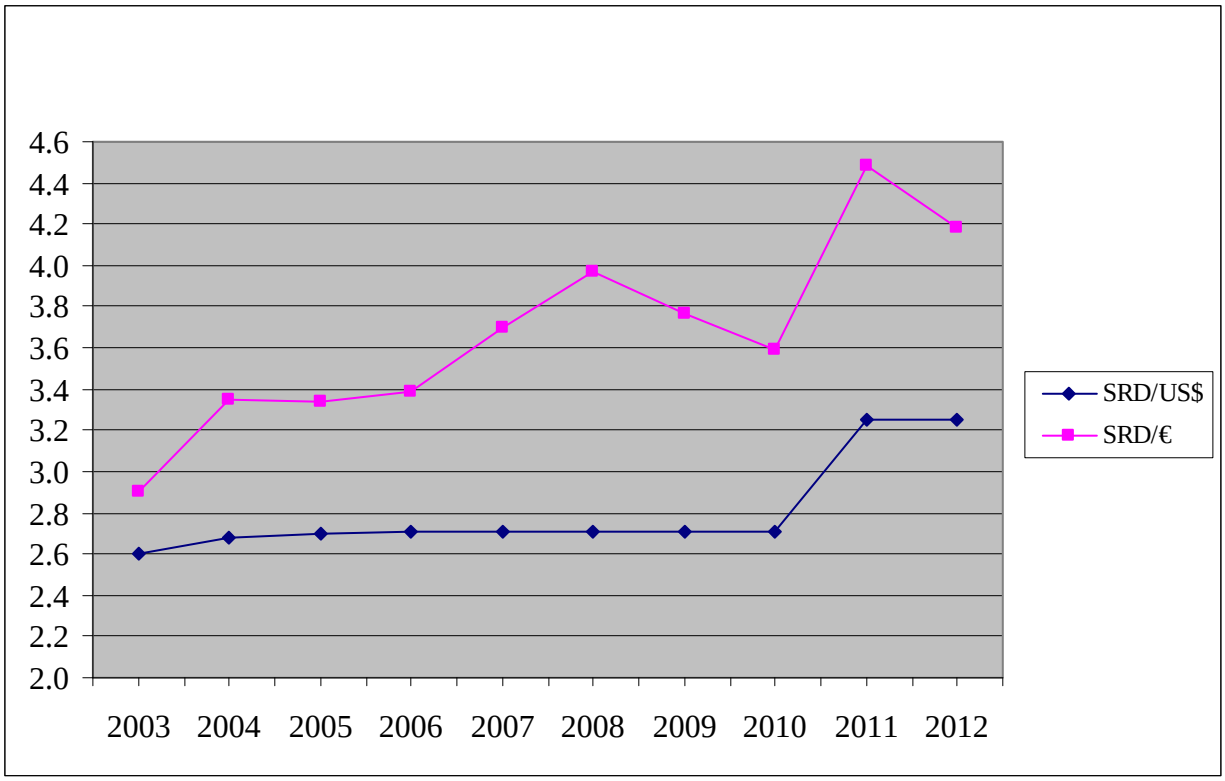

Figure 2: Average exchange rates Suriname for the period 2003-2012.

Source: Central Bank of Suriname (www.cbvs.sr)

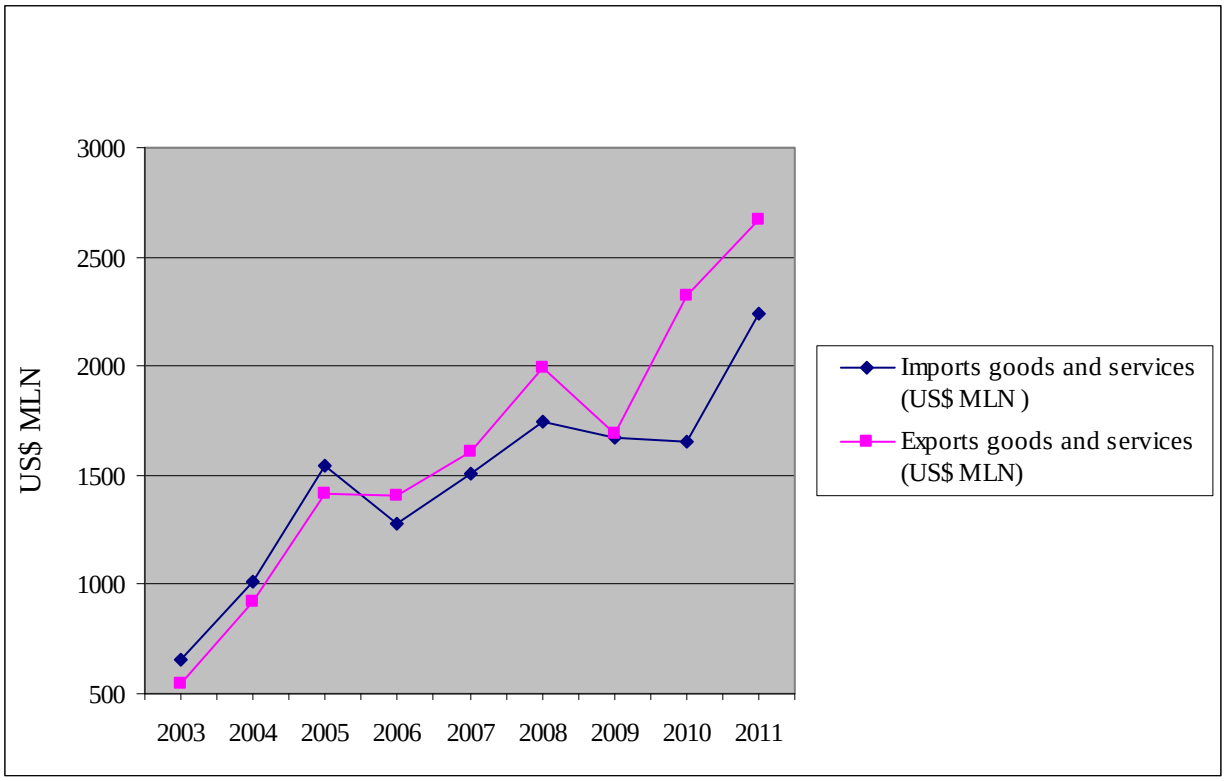

Figure 3: Imports and exports of goods and services of Suriname at current prices for the period 2003-2011

Source: www.unctad.org

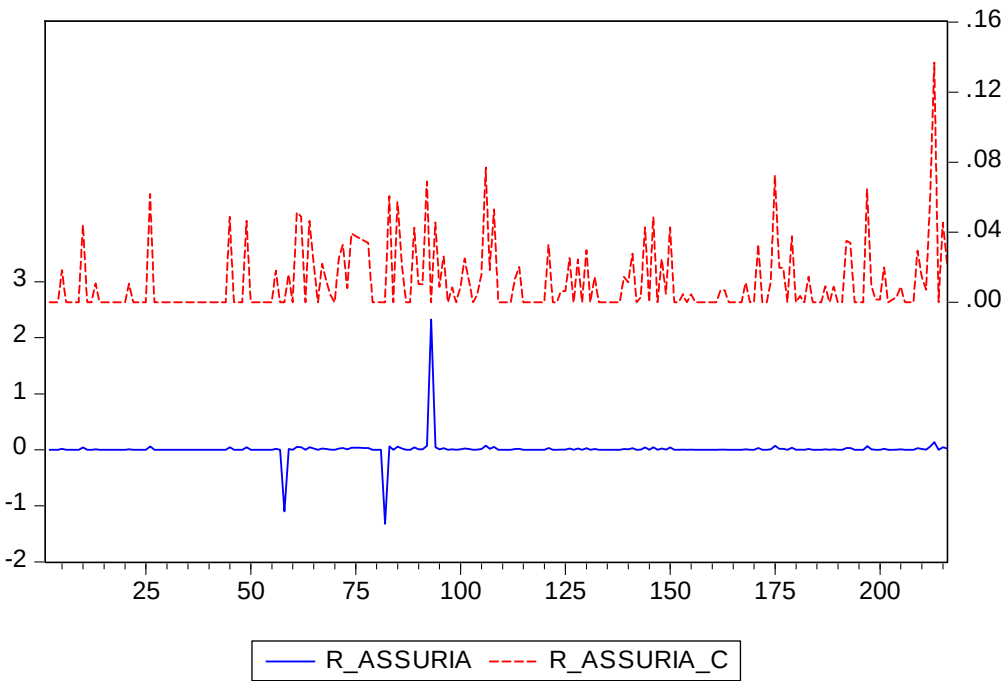

Figure 4: Returns and corrected returns for Assuria

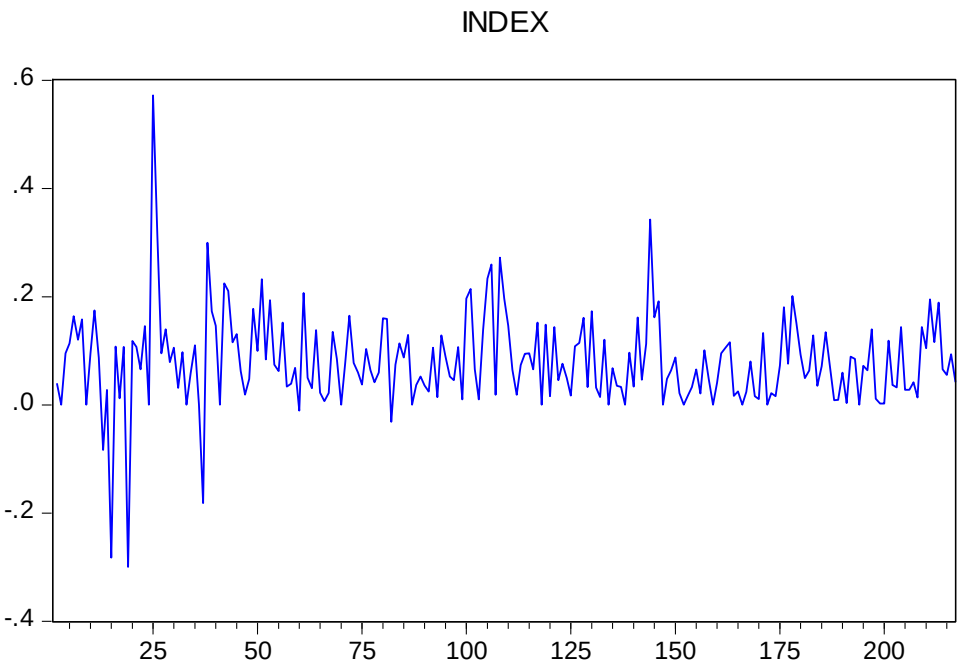

Figure 5: An index of returns on the Suriname stock exchange

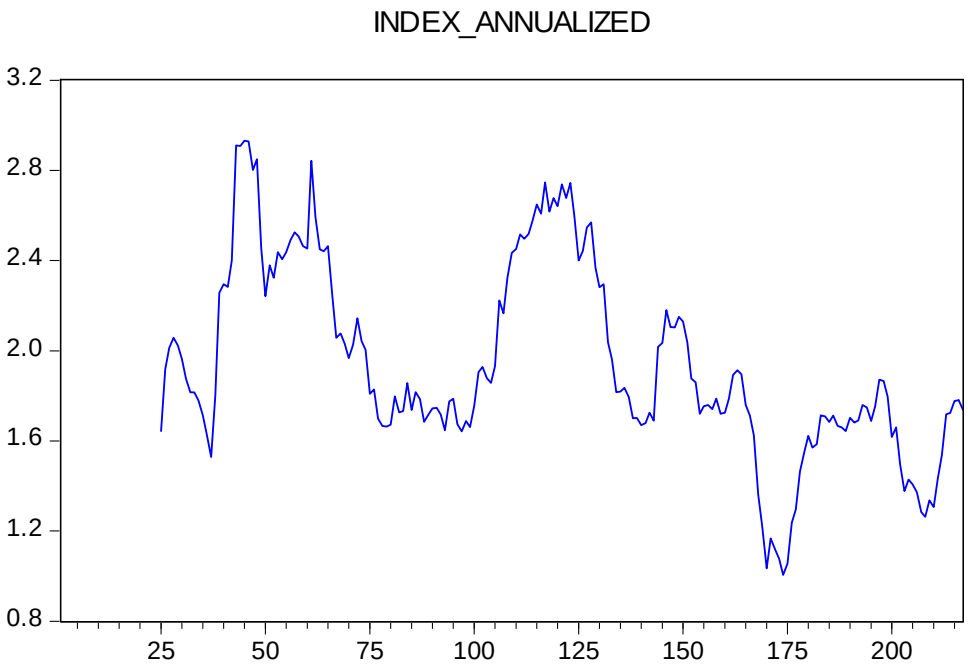

Figure 6: 24-period moving average

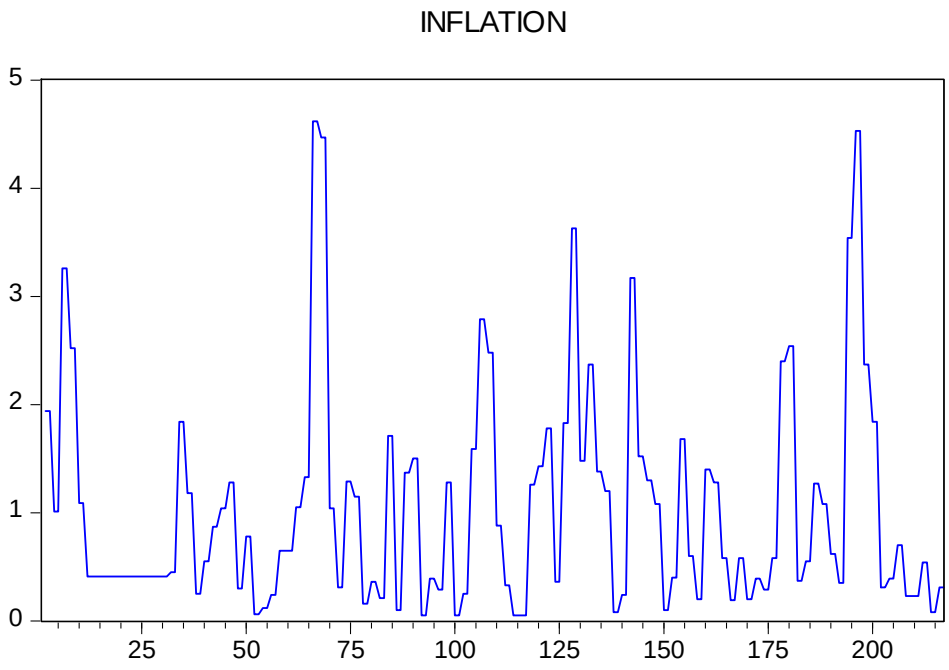

Figure 7: Two-weekly inflation (based on monthly inflation figures)

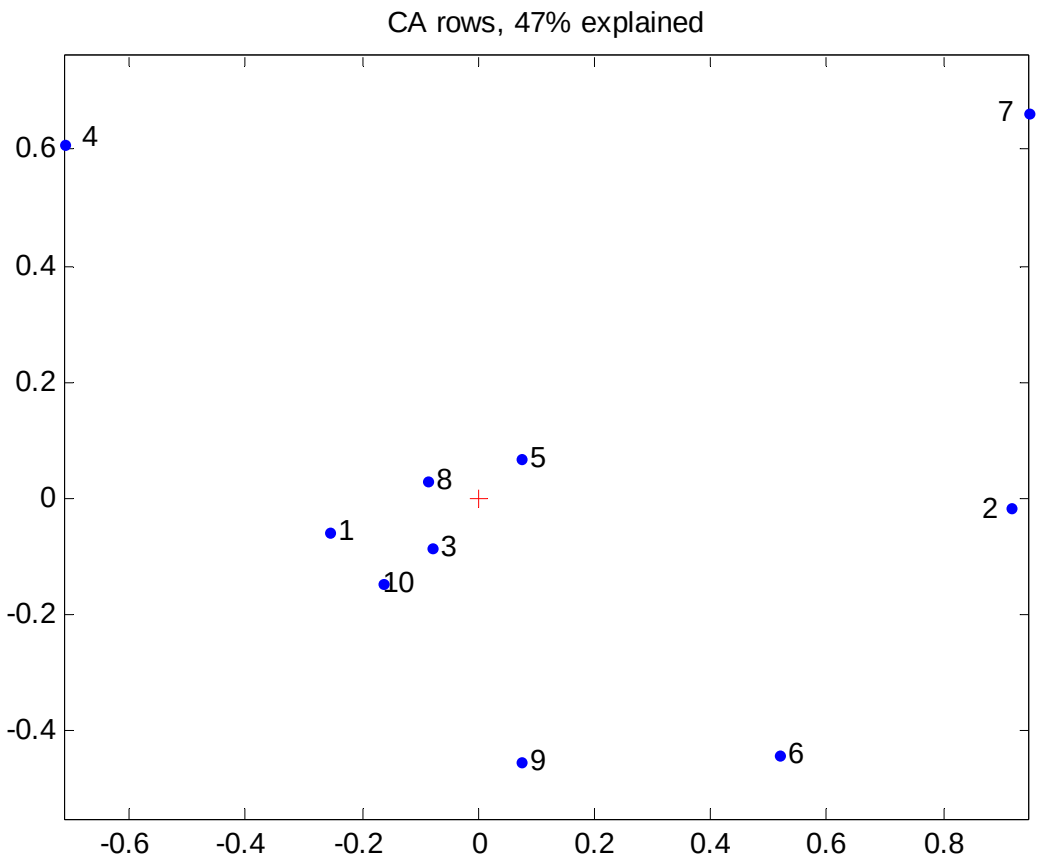

Figure 8: Outcomes of correspondence analysis, when the data input is as in Table 4. The closer the points are in this figure, the more correlated are their respective returns data. The numbers associate with the stocks as they are is given in Table 1.

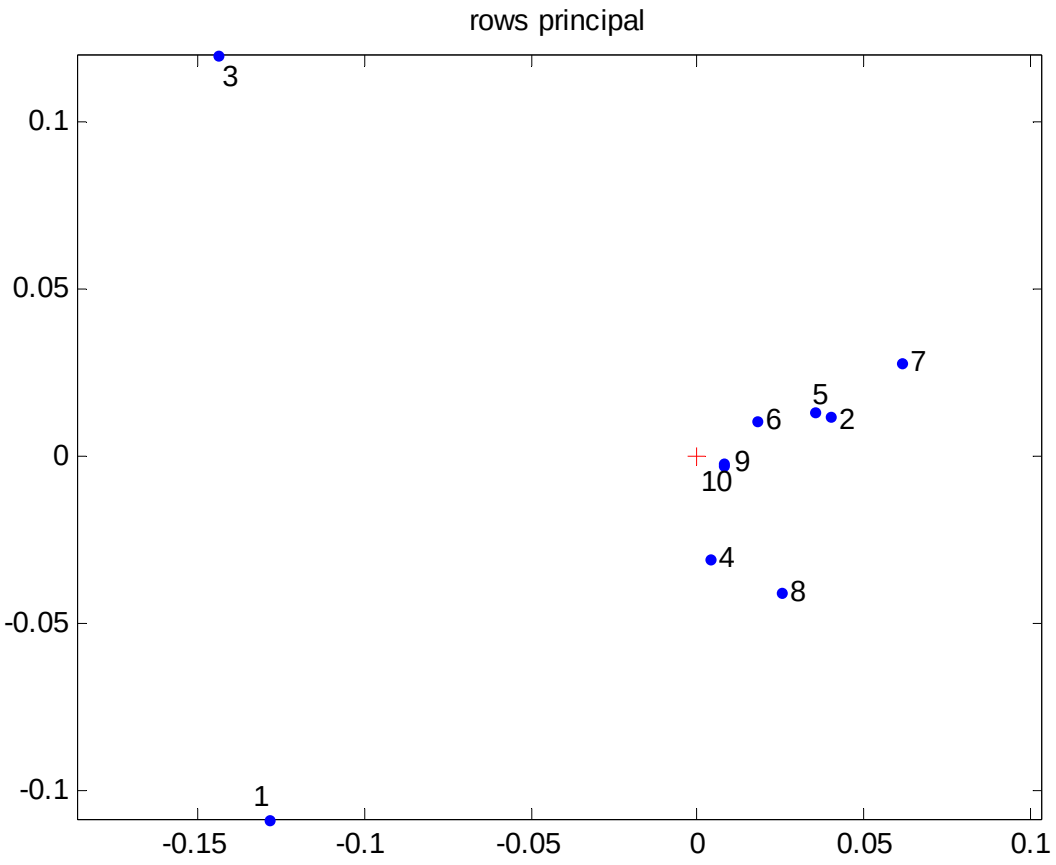

Figure 9: Outcomes of correspondence analysis, when the data input is as in Table 5. The closer the points are in this figure, the more correlated are their respective returns data. The numbers relate to the stocks as they are given in Table 1.

Appendix A: Information about the listed companies

At present, the number of listed companies at the SSE is 11. These companies are Assuria Ltd., Consolidated Industries Corporation Ltd., The Surinam Bank, Elgawa Ltd., Hakrinbank Ltd., VSH Foods Ltd., The Surinam Insurance Company Ltd., The Surinam Brewery Ltd., The Torarica Group of Hotels, Varossieau Coating Industries and VSH United. In addition, the State Oil Company of Suriname issued in 2010 bonds to partially finance its investment program.

Assuria Ltd. (Assuria) is an insurance company and her history dates back to 1889. Through its subsidiaries, Assuria offers life and general insurances. Assuria is also a large institutional investor and is especially active in the field of mortgage loans and real estate development. Furthermore, she invests in the international capital market. As of December 2011, there are 181 employees employed at Assuria.

Consolidated Industries Corporation Ltd. (CIC), established in 1967, is a manufacturing company. Its commercial activities comprise of the production and distribution of powder detergents for household and industrial use and the production of plastic packaging materials**.** Throughout the years CIC has succeeded in achieving and holding the position as market leader in Suriname in a number of product groups. As of December 2011, there are 123 employees employed at CIC.

The Surinam Bank (DSB), which has been established shortly after the abolishment of slavery (1863), is in the banking industry and it is the largest commercial bank in Suriname. They offer services to both the business and private markets. For the reporting period 2011, there were 371 employees at DSB.

Elgawa Ltd. (Elgawa) is a private company categorized in the services and trading sector. Elgawa is specialized in electric engineering and installation.

Hakrinbank Ltd. (Hakrinbank) started its activities in June 1936 and is a commercial bank in Suriname. They offer financial services to both the business and private markets. As of December 2011, 278 employees are employed at Hakrinbank.

VSH Foods Ltd., formerly known as Margarine, Fats and Oil Company Ltd. (Mavefa), has been established in 1960 and it is part of the VSH-United Group. VSH Foods is a manufacturing company and its activities include the production and distribution of margarine, butter and other food components. Currently, the company counts 41 employees.

The Surinam Insurance Company Ltd. (Self Reliance), has been established in 1980, and it is an insurance company which offers various insurances packages. At the end of 2011, there were 130 individuals employed at Self Reliance.

The Surinam Brewery Ltd. has been established in 1955, and it is a manufacturing company. It brews, produces, sells and distributes alcoholic beverages. In addition, the brewery exports beer to various countries. At the end of 2011, there were 96 individuals employed at the Surinam Brewery.

The Torarica Group of Hotels (Torarica), which was established in 1962, is in the services sector. Torarica offers hotel rooms and other facilities and is also specialized in arranging meetings and events. During the reporting year 2011-2012, Torarica has 359 employees.

Varossieau Coating Industries (Varossieau), has been established in 1959, and it is a manufacturing company and produces and sells paint and paint accessories. For the reporting period 2011, there are 62 employees.

Finally, the eleventh company listed at the SSE is VSH-United, which has been established in 1958. It is a group of companies headquartered in Suriname and the Group activities include shipping, trading, manufacturing, real estate development and management. Other associated companies are involved in insurance, banking and in the hospitality industry. VSH United started its trading activities on the SSE as of January 2006. For the reporting period 2011, the Group employed 327 persons.

For our analysis in this paper we aim to have the longest span of data possible. Except for VSH United, we have data starting in 2003. Therefore, we analyze the stock returns of the first 10 companies.

Appendix B: Development of the Suriname Stock Exchange

Year	Number of listed companies	MCAP	**GDP current (SRD)	MCAP/GDP
2003	11	* 145.011.350	3.306.381.000	4%
2004	10	* 263.692.633	4.057.509.000	6%
2005	10	* 375.570.799	4.900.000.000	8%
2006	11	371.276.669	7.206.000.000	5%
2007	11	752.886.387	8.061.000.000	9%
2008	11	565.890.210	9.698.000.000	6%
2009	11	672.505.985	10.638.000.000	6%
2010	11	977.743.599	11.989.000.000	7%
2011	11	1.291.719.887	14.067.000.000	9%

Notes:
Measures of stock market development are: number of companies listed and the MCAP/GDP ratio (represent stock market size).
MCAP is defined as market capitalization and is calculated by the number of outstanding shares per stock multiplied by respective stock's closing price.
GDP is defined as Gross Domestic Product (GDP) at current local prices.
According to these 2 measures, the SSE has not grown remarkably.
* Due to data unavailability, estimated amounts of MCAP are produced.
** GDP data derived from the World Bank and Central Bank of Suriname.

Year	Volume of shares traded	Total value of shares traded (SRD)	GDP current (SRD)	Turnover/GDP	Turnover ratio
2003	* 52.004	*225.019	3.306.381.000	0%	0.2%
2004	* 27.169	*154.317	4.057.509.000	0%	0.1%
2005	161.773	831.309	4.900.000.000	0%	0.2%
2006	198.888	1.769.966	7.206.000.000	0%	0.5%
2007	143.330	1.845.384	8.061.000.000	0%	0.2%
2008	*11.172	* 175.853	9.698.000.000	0%	0.0%
2009	36.640	753.483	10.638.000.000	0%	0.1%
2010	7.920	208.116	11.989.000.000	0%	0.0%
2011	14.416	562.796	14.067.000.000	0%	0.0%

Notes:
Measures of liquidity are: turnover/GDP and turnover ratio (Craigwell and Alleyne, 2004)
Turnover is the market value of all traded shares during the year. Turnover ratio is calculated as Turnover/MCAP. The greater these two ratios the higher the liquidity but for the SSE this is not the case.
* Due to data unavailability, estimated amounts are produced. (Source: half monthly reports SSE January 2003 – December 2011).

Appendix C: Data in original format (an excerpt)

Date	Assuria	C.I.C.	De Surinaamsche Bank	Elgawa
05/1/2006	2.60	6.10	7.70	1.60
19/1/2006	2.70	6.10	7.70	1.60
02/2/2006	2.80	6.10	7.70	1.60
16/2/2006	2.90	6.10	7.72	1.60
02/3/2006	3.00	6.10	7.75	1.60
16/3/2006	3.00	6.10	8.15	1.60
23/3/2006	3.00	6.10	8.15	1.60
06/4/2006	3.00	6.10	8.15	1.60
20/4/2006	3.00	6.50	8.15	1.60
04/5/2006	0.80	6.30	8.15	1.60
18/5/2006	0.85	6.40	8.15	1.60
01/6/2006	0.85	6.50	8.15	1.60
15/6/2006	0.90	6.70	8.15	1.60
06/7/2006	0.92	6.70	8.25	1.60
20/7/2006	0.92	6.70	8.25	1.60
03/8/2006	0.92	6.70	8.25	1.60
17/8/2006	0.96	6.80	8.40	1.60
07/9/2006	0.97	6.80	8.50	1.60
21/9/2006	0.98	6.80	8.50	1.60
05/10/2006	1.05	6.80	8.70	1.60
19/10/2006	1.07	6.80	8.70	1.60
19/10/2006	10.70	6.80	8.70	1.60
02/11/2006	11.20	6.80	8.70	1.70
16/11/2006	11.30	6.80	8.90	1.80
07/12/2006	11.60	6.80	8.90	1.80
21/12/2006	11.60	6.80	9.00	1.80

Appendix D: The days with stock price information

	Years								
Month	2003	2004	2005	2006	2007	2008	2009	2010	2011
January	9, 23	8, 22	6, 20	5, 19	4, 18	3, 17	8, 22	7, 21	6, 20
February	6, 20	5, 19	3, 17	2, 16	1, 15	7, 21	5, 19	4, 18	10, 24
March	6, 20	4, 18	3, 17	2, 16	1, 15	6, 20	5, 19	4, 18	10, 24
April	3, 17	1, 15	7, 21	6, 20	5, 19	3, 17	2, 16	1, 15	7, 21
May	8, 22	6, 20	5, 19	4, 18	3, 17	8, 22	7, 21	6, 20	5, 19
June	12, 26	3, 17	2, 16	1, 15	7, 21	12, 26	4, 18	3, 17	2, 16
July	3, 17	8, 22	7, 21	6, 20	5, 19	3, 17	2, 16	8, 22	7, 21
August	7, 21	5, 19	4, 18	3, 17	2, 16	7, 21	6, 20	5, 19	4, 18
September	4, 18	2, 23	1, 15	7, 21	6, 20	4, 18	3, 17	2, 16	1, 15
October	2, 16	7, 10	6, 20	5, 19	4, 18	2, 16	1, 15	7, 21	6, 20
November	6, 20	4, 18	10, 17	2, 16	1, 15	6, 20	5, 19	4, 18	3, 17
December	4, 18	2, 16	1, 15	7, 21	6, 20	4, 18	3, 17	2, 16	1, 15

Appendix E: Data on inflation

	Year								
Month	2003	2004	2005	2006	2007	2008	2009	2010	2011
January	1.94	0.41	0.78	1.29	1.28	1.78	1.30	0.20	3.54
February	1.01	0.41	0.06	1.15	0.05	0.36	1.08	0.39	4.53
March	3.26	0.41	0.12	0.16	0.25	1.83	0.10	0.29	2.37
April	2.52	0.45	0.24	0.36	1.59	3.63	0.40	0.58	1.84
May	1.09	1.84	0.65	0.21	2.79	1.48	1.68	2.40	0.31
June	0.41	1.18	0.65	1.71	2.48	2.37	0.60	2.54	0.39
July	0.41	0.25	1.05	0.10	0.88	1.38	0.20	0.37	0.70
August	0.41	0.55	1.33	1.37	0.33	1.20	1.40	0.55	0.23
September	0.41	0.87	4.62	1.50	0.05	0.08	1.28	1.27	0.23
October	0.41	1.04	4.47	0.05	0.05	0.24	0.58	1.08	0.54
November	0.41	1.28	1.04	0.39	1.26	3.17	0.19	0.62	0.08
December	0.41	0.30	0.31	0.29	1.43	1.52	0.58	0.35	0.31

Source: General Bureau of Statistics of Suriname. For the years 2003-2008, the inflation figures concern Paramaribo and Wanica. For the years 2009-2011, the figures concern Paramaribo, Wanica, Nickerie, Saramacca, Coronie and Commewijne. Due to fire, no data were available for July 2003 to March 2004, for which we have used the data of June 2003. In January 2009 the base year was changed. We replaced the original inflation rate (57.76) by a new value which is the average of December 2008 and February 2009.

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