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Valuation of Investment Companies in Chile

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Extracto

Si bien no existe una definición clara de sociedades de inversión en Chile, generalmente se entiende que se refiere a sociedades anónimas con inversiones en otras sociedades (con o sin control), y sin tener activos productivos propios. Una pregunta natural que surge es si el valor que tienen en el mercado es igual o no al valor económico de los activos en que invierten, y de no ser así, qué factores podrían explicar la diferencia.

JLE Classification: G10, G12, G13, G15 and G23

La evidencia internacional para conglomerados indica que existiría un castigo en su valor de mercado, y también en el caso similar (aunque no idéntico) de fondos mutuos cerrados
En este trabajo estudiamos la existencia y explicación del un descuento a las sociedades de inversión chilenas.

Nuestros resultados son los siguientes: encontramos un castigo promedio de 28% en la muestra de 22 sociedades de inversión estudiadas en el período diciembre 1993-diciembre 1999; y la estructura de premios y descuentos es explicada en un 83% por cuatro variables. Los resultados son consistentes con las siguientes hipótesis: el descuento de las sociedades de inversión es mayor mientras mayor sea el control corporativo (mayoritarios pueden maximizar su propio bienestar en desmedro de minoritarios), mientras menor sea la inversión en empresas relacionadas (es decir, mientras más sociedad de inversión sea, en contraste con una empresa productiva), mientras menor la inversión en sociedades de inversión mantenida en la cartera (problema de agencia entre accionistas), y mientras mayor sea la restricción regulatoria a la inversión de fondos de pensiones (mientras menor sea el Activo Contable Depurado).

Abstract

Though no clear definition of investment companies exists in Chile, it has been generally understood to refer to companies that have investments in other companies (with or without corporate control) but that do not own productive assets. A question that naturally arises is whether the market value of investment companies is equal to the economic value of the assets in which they invest, and if not, what factors account for the difference.

International evidence indicates that for conglomerates a discount on market value would exist and also the situation would be similar (although not identical) to closed-end funds.
In this paper we study the existence and explanation of a discount to Chilean investment companies. We find an average discount of 28% in a sample of 22 investment companies studied in the period December 1993 – December 1999; and the structure of premiums and discounts is explained in an 83% by four variables.

The results reported in this study are consistent with the following hypotheses: The discount of the investment companies is positively related to the percentage of insider ownership (insiders can maximise its wealth to the detriment of outsiders). On the other hand, it is negatively related to: the investment in filiated and related companies, the amount invested in investment companies maintained in the portfolio (probably due to an agency problem among shareholders), and the Depurate Book Value of Assets (a regulatory accounting restriction that affects Chilean pension fund investments)

1. Valuation of Investment Companies in Chile[1]

In Chile pure investment companies are understood as those that have securities of other companies (with or without corporate control) but do not own productive assets. A question that naturally arises is whether the market value of investment companies is equal to the economic value of the assets in which they invest, and if not, what factors account for the difference.

Similarly to closed-end funds[2] international evidence reports a discount on market value for conglomerates. For example, Lee, Schleifer and Thaler (1991) and Burton Malkiel (1977 and 1995) find that the stocks of closed-end funds are generally traded at a discount with respect to their net value of the assets (NAV). Exploratory research indicates that the Chilean stock market also penalises these companies, if the value is compared with the underlying value of assets [see Samaniego (1998) and Buzeta (1999)]. This is a puzzling result, since an arbitrageur (especially a company that is not liable for taxes)

[1] The authors are grateful for valuable comments made by Professor Burton Malkiel (Princeton University) to some of the hypotheses proposed in this paper. The authors also want to thank Professor Jorge Gregoire (Universidad de Chile), and Mr. Cristián Ross (Comisión Clasificadora de Riesgo) for their comments. We would like to thank the participants at LACEA 2002 (Barcelona. Spain) and The Fourth Congress of Finance in Chile 2002 (Santiago, Chile) for helpful comments. Any errors or omissions are the responsibility of the authors.

[2] *Closed-end Funds* are investment companies that (unlike conglomerates) have fixed capitalisation, i.e., they have a fixed amount of outstanding number of shares. So, if an investor wants to either buy or sell the stock the only route is the secondary market. In Chile, Closed-End Funds include Venture Capital Funds (FIDEs), although these types of funds may issue stocks occasionally to finance new investments.

may buy all the stocks of the Fund and sell them on its NAV [see Copeland and Weston (1988)].

Research on investment companies in Chile has explored factors of ownership concentration and liquidity as variables that might explain the discount without conclusive results (see Samaniego, Buzeta). Using a longer period of time, and a more rigorous sample selection procedure, we seek to explain this phenomenon employing a different methodology and formulating new hypotheses. We find an average discount of 28 percent on the sample of 22 investment companies studied during the period December 1993 – December 1999; and the variability of premiums and discounts is explained in an 83 percent by four variables. These variables are: the percentage of equity ownership by the five major shareholders, investment percentage in filiated and related companies[3], percentage invested in investment companies over the total value of the portfolio and Depurate Book Value of Assets. The results are consistent with the following hypotheses: The discount of the investment companies is positively related to their corporate control (insiders may maximise their wealth to the detriment of the outsider minority). In contrast, it is negatively related to investment in filiated and related companies, to the percentage invested in investment companies hold in the portfolio (likely due to an agency problem within shareholders), and to the Depurate Book Value of Assets.

This paper is organised in six sections. Section 2 reviews the literature and includes a critical discussion about which variables could be applied to the Chilean market. Section 3 suggests hypotheses about Chilean investment companies. Section 4 describes the methodology and the sample, and Section 5 presents the results. Section 6 provides a brief summary and conclusions.

[3]Affiliates are defined as investment with more than the 50% of the equity and it is called related companies if has less than the 50%.

2. Discussing the Literature

In general, the structure of premiums and discount of closed end funds has been not widely studied. In the US market, there are three important papers: Burton Malkiel (1977 and 1995) and Lee, Schleifer and Thaler (1991).

Malkiel (1977) presents a cross-section analysis of a sample for the 24 most important closed-ends funds in the period 1967-1974. The paper reports an average discount of 20 percent, and explores plausible explanations for this, which are as follows.

i) Unrealised Capital Gains

According to this hypothesis, investors are faced with a tax liability when they buy stocks with unrealised capital gains, since they will have to pay capital gain taxes when they sell the stock.

Unfortunately, it is not possible to measure this effect in Chile because the majority of investments are made in private companies, and no appropriate measure of the NAV exists.[4]

ii) Dividend Policy

The dividend policy may have three effects upon the attractiveness of fund stocks. First, a policy of distributing the profits tends to decrease unrealised capital gains appreciation and thus limits future taxable liabilities. Second, if most of the shareholders pay lower taxes and have high cash needs, they will prefer funds that pay high dividends and allow them to avoid brokerage costs. Third, if Closed-end Funds are traded at a discount, high dividends will be valued by the investors because in this way they effectively transform into cash part of the fund's assets; this being the only way in which investors can immediately benefit from the discounts.

[4] The only investment companies in the sample that practically do not have investment in private companies are Almendros, Chispas Holdings, Luz y Fuerza and Marinsa.

In the Chilean case this measure is limited by legal requirements with regard to publicly held companies. They are required by law to distribute at least 30 percent of their net profits as dividends, which make difficult to distinguish dividend payment decisions from simple fulfilment of the regulations.[5] In addition, it is difficult to obtain accurate information because private companies do not have to report their dividend payments to the market; this affects all the companies in the sample, with the exception of Almendros, Chispas, Luz y Fuerza and Marinsa.

iii) Stock letter

Some funds invest a high percentage of their assets in stocks whose sale is restricted. This type of investment is called a "stock letter" because investors are required to sign a letter indicating that the stock has been bought for investment purposes and that the funds will be kept in the stocks for a considerable period of time. These stocks are not registered and they have a very low level of liquidity so their market value is not an indication of their fundamental value. Consequently, funds with large amounts invested in "stock letters" can be sold to relatively large discounts.

Chile does not have stock letters, but the argument of liquidity might be applicable if the investment companies buy stocks with lower liquidity than their own stocks.

iv) Foreign Stocks Hold

Some Closed-end Funds invest exclusively in foreign stocks,[6] which, because of taxes and foreign exchange controls, can turn out to be attractive to investors. However, Malkiel argues that in most cases investors could replicate the fund' portfolio, in which case the premium or discount explained by this factor should be small. The Chilean investment companies in the sample have negligible foreign investments, so that this effect is not relevant.

[5] At least 7 of 22 of the companies referred to in this study in the period 1993 to1995 paid the minimum required by law. These companies were: Almendros, Calichera, Copec, Marinsa, Minera, Oro Blanco and Vapores (see Fuentes and Maquieira (2000)).

[6] In Chile, an example could be the FICE that lost popularity after Chilean companies issued ADRs in United States.

v) Former Performance

Investors should be willing to pay a premium for the stocks of the fund if they believe that the management is capable to obtain an above-normal performance. In this case premiums and discounts could be associated with former performance and used as a *proxy* for future performance. Though this hypothesis seems reasonable for investment companies in Chile, particularly for those controlled by a successful economic group, it is difficult to isolate performance from other factors. Malkiel used a five-year stock return period as a proxy of performance. However, he did not find this effect significant, likely because of the short period of time to evaluate performance and the lack of control over the economic sector in which investments were made.

vi) Turnover

The portfolio theory and the concept of efficient markets suggest that managers should buy and maintain a well-diversified portfolio of common stocks according to the level of risk preferences of the fund's shareholders. Some (small) portfolio turnover is required to maintain diversification, but Malkiel argues that Closed-end Funds managers overtrade, with the result of higher brokerage commissions and taxes for the investor. It is difficult to identify this effect because the turnover is negatively correlated with unrealised capital gains and positively related to dividend payout. In the case of Chilean investment companies the argument is not directly applicable because the purpose is not necessarily (not even generally) to maintain diversified investment by an economic sector.

vii) Management Costs

Based on some evidence that shows that there is no significant relation between the fund's return and the management fees, Malkiel argues that these expenses can be considered a net loss to investors. Consequently, funds with greater management expenses should trade at higher discounts. Again, this effect is not applicable to Chilean investment companies, since their managers have salaries related to business performance, not to portfolio performance.

The statistical evidence reported by Malkiel is consistent with the four first hypotheses: unrealised capital gains, dividend policy, stock letters and foreign stock hold. Subsequently, Malkiel (1995) reviews his previous study to see whether significant changes had occurred. Using the same methodology for a sample of 30 companies for January 1994 data, he finds a much lower discount (6 percent) and incorporates a new hypothesis (corporate control), which is detailed as follows.

viii) Corporate Control

If an investor (or a blockholder) has a high percentage of ownership, the discounts will be greater. The intuition is as follows: Investors in funds that trade at large discounts would receive immediate profits if funds were sold at NAV. A high percentage concentrated in an investor can diminish the probability of liquidation, making it more difficult for a successful (hostile) take-over to obtain the control. However, the results reported by Malkiel do not support his new hypothesis.

In the Chilean case for the period of this study there was no legislation to regulate corporate control, and thus we expect corporate control to be important, although for a different reason. Due to the lack of protection for outsider shareholders, the degree of corporate control is directly related to potential redistribution of wealth from outsiders to insiders, resulting in a discount to investment companies. This effect is particularly relevant in the Chilean legal system, which is based on the French Napoleonic code and is in sharp contrast to the common law system (see Laporta et al. 1997, 1998).

ix) *Investor Rationality*

Lee, Schleifer and Thaler (1991) examine whether it is possible to explain fluctuations in closed-end fund discounts by changes in investor sentiments, defined as the expectations of future stock returns. The authors suggest that there are two types of investors: *rational investors*, who have rational expectations about the future asset returns; and *irrational investors*, whose expectations are based on their sentiments about the future stocks' performance.

They can either over- or under-estimate the returns relative to the expectations of the rational investors. Individual investors (irrational type) tend to invest in closed-end funds while companies (rational type) tend to invest in individual securities (Michaely and Shaw, 1994). Therefore, a change in the feelings of the irrational investors will affect closed-end funds prices, but not the value of their underlying assets, changing the discount of the closed-end funds.

The institutional investors in Chile invest in both investment companies and individual stock, so the argument is unclear.

3. Hypotheses for the Chilean case

In principle, the following hypothesis posed by Malkiel would be applicable to Chilean investment companies: unrealised capital gains, dividends, former performance and corporate control (although this last would be for a different reason). Of these, because of problems in measuring the variables, we only include the last one. In this study the following hypotheses are put forward as an explanation of the premiums and discounts variability that applies to Chilean investment companies:

a) Liquidity

Similar to Malkiel's (1977, 1995) arguments about letter stocks, if the investment companies' shares have lower liquidity than its investments, the market will discount their stocks since they are less traded. As a result, if someone invests in these companies instead of on an equivalent portfolio, should ask for a liquidity premium, which will result in a discount.

b) Corporate Control

Corporate control has an ambiguous effect because of two phenomena not exclusive to but valid for any investment company: (i) The higher the proportion of shares held by insiders, the greater the degree of asymmetric information between them and outsider shareholders will be. As a result, the insiders will maximise their own wealth to the detriment of the outsiders,

increasing discounts to the investment companies stocks.[7] Also (ii) a greater concentration of ownership generates to shareholders (controllers) greater incentives to control the management, thereby diminishing the agency problems among shareholders and management. This latter incentive improves efficiency, reducing the discount.

c) Productive versus Investment Companies

If an investment company maintains permanently stocks of other companies, it could behave more as a productive rather than as an investment company. The market will differentiate those companies from the last ones, and therefore they will be subject to a lower discount.

d) Intermediate investment companies

Investing in other investment companies has an ambiguous effect. First, since the stocks of an investment company trade at a discount, when they are bought by another Investment Company, it would be expected that the same factors that explained the original discount would be present, implying a higher discount. Second, there are advantages in investing in the conglomerate itself instead of buying stocks of the intermediate companies due to potential agency problems among shareholders. In effect, buying shares of the conglomerate will reduce the potential wealth transfers among filiated and related companies arising from perks or transactions made at prices different from market prices, both benefit the insider at the expense of outsiders.

e) Investment in private companies

We expect an ambiguous result. Since most private companies are not regulated by the Chilean SEC (Superintendencia de Valores y Seguros), their financial statements are not public, enlarging the information asymmetry between insiders and outsiders. For this reason, we would expect a higher

[7] This is especially important since the first Public Offering Law was passed in the second semester of 2000, and so in our sample, minority shareholders were unprotected in Chile.

discount in investment companies with greater proportion of investment in private companies. On the other hand, we could expect a premium, if the private companies belong to economic sectors that are not represented in the stock market (Lins y Servaes, 1999), because of diversification benefits.

Finally, there is a measurement problem that makes difficult to arrive at a clear conclusion. The traditional methodology used to compute premiums and discounts to investment companies tends to have a negative bias if they invest in private companies. The NAV is usually computed as market value of publicly held companies plus book value of private companies. Because on average book values have been historically below stock market prices, the value of underlying investments will be under-estimated using this methodology. This measurement problem biases the result in favour of the diversification hypothesis against the asymmetric information hypothesis[8].

f) Regulation of institutional investors

Law 3,500 discourages the investment of pension funds in investment companies. Since in Chile there is no clear definition of an investment company, the Law defined the concept of Depurated Book Value of Assets (*Activo Contable Depurado*). The pension funds are allowed to buy stocks if and only if the ratio between Depurate Book Value of Assets and total book value of assets is at least forty percent (Title IV, Article 45 bis) and the investment limits are higher while greater this ratio (Title IV, Article 47)[9].

[8] To minimise this bias we also compute the discounts and premiums taking the ratio between book value and market value of public companies that belong to the same industries. Thus, in this way we develop a proxy of the market value for the private companies.

[9] This regulation limits (and in extreme cases, prohibits) the investment of Pension Funds in companies (i) where resources are generated far away from the headquarter, (ii) that don't have influence in the management of the related companies where the assets are held, (iii) that do business with Affiliates and related companies that do not correspond to their core business, (iv) with Affiliates and related that do not deliver public economic and financial information, and (v) with Affiliates and related companies established in countries with greater sovereign risk than Chile (as measured by international rating agencies).

The legislation of the Depurated Book Value of Assets heavily penalises Pension Funds investment in companies that have productive assets in related companies where they do not have the control over the dividend policy. On the other hand, if it is a *holding* that mainly controls the companies where the investments are made and where the productive assets are held, it will be less penalised.

Due to the importance of Pension Funds in the Chilean capital market, this regulation was passed in January 1995 and suggests that smaller Depurate Book Value of Assets implies more investment restrictions to Pension Funds[10] and therefore conveys a higher discount. We will also explore the existence of a structural change in the date that this regulation came into effect (January 1995).

4. Methodology and Sample

A. *Sample Selection*

We include in the sample those companies that in the period December 1993[11] - December 1999 fulfilled the following criteria:

(i) Companies, whose assets are made up of at least 50 percent of marketable securities, filiated companies, related companies and other companies;

(ii) Companies that were traded in the stock market (to compute premiums or discounts);[12]

(iii) Companies that have been traded for at least 80 percent of the period[13]; and

(iv) Companies that have maintained an annual presence in the stock market greater or equal to 50 percent[14].

[10] The gradual limits are defined for fixed income securities, as reported in *Circular 1148* of the SAFP (Superintendence of Pension Funds). In the case of the stocks, they are either eligible or not, depending whether the Depurated Book Value of Assets is over 40 percent or not. It is possible that, while the stocks of a company are not eligible, its fixed income securities are.

[11] We began at this date because before December 1993 the Financial Statements (*FECUs*) were reported annually and not quarterly.

[12] There were 43 companies that fulfilled these requirements in the period December 1993 to December 1999: Almendros, Andina, Antarchile, Banmédica, Bicecorp, CB TI, CB Capital, CB Inverin, Calichera, Campos, CAP, Cementos, Chilquinta, Chispa uno, Chispa dos, Colina, Copec, Coloso, CMPC, Enersis, Elecmetal, Fósforos, Indiver, Inforsa, Invercap, Lascar, Luz y Fuerza, Luz A, Marinsa, Minera, Navarino, Naviera, NorteGrande, Oro Blanco, Pasur, Quiñenco, Penta, Pizarreño, Security, Siemel, Sipsa, Santagroup and Vapores.

[13] This criterion excluded from the previous list the following 8 companies: Andina, CB TI, CB Capital, CB Inverin, Santagroup, Luz A, Security and Quiñenco.

[14] Upon applying this criterion 13 companies were excluded from the list: Banmédica, Colina, Coloso, Elecmetal, Fósforos, Invercap, Lascar, Navarino, Naviera, Penta, Pizarreño, Siemel, Sipsa. Luz A and Security, are companies already deleted (iii) and they neither satisfy this judgement.

Applying the above selection process, a sample of 22 companies was obtained (Sample A), which included the following companies: Almendros, Antarchile, Bicecorp, Calichera, Campos, CAP, Cementos, Chilquinta, Chispa uno, Chispa dos, CMPC, Copec, Enersis, Indiver, Inforsa, Luz y Fuerza, Marinsa, Minera, Nortegrande, Oro Blanco, Pasur and Vapores.

If we eliminate from the sample firms that invest only in privately held companies (because of the difficulty of estimating premiums or discounts in this case), the sample is reduced by four companies[15], thus becoming 18 firms (Sample B).

We compute for each company, each month, premiums (if positive) or discounts (if negative) in the period December 1993 – December 1999, according to the following formula:

$$DISC_t = \frac{MC_t - NAV_t}{NAV_t}$$

Where

$DISC_t$ = premium (if positive) o discount (if negative) to the investment company[16].

$MC_{i,t}$ = market capitalisation of the company i in month t.

$NAV_{i,t}$ = net asset value of the company i in month t, defined as the difference between the market value of the assets[17] and the book value of liabilities since they are not traded in the market.

[15] These are: CAP, Cementos, Inforsa and Vapores. It is interesting that of these three companies, only Vapores presents an average discount (29.35%) instead of an average premium (likely induced by the measurement bias discussed previously).

[16] It is called "DISC" because generally it is negative.

[17] The market value of the assets is estimated by adding the market capitalisation of the traded stocks and the book value of other assets. The market capitalisation is computed as the product between the number of stocks of the Issuer Company times the closing price of the last day of each month.

Because book values are reported quarterly, this information is linearly interpolated to obtain monthly estimated book values. Average discounts for the companies in the sample were obtained (i) by computing the simple average for each company and for the sample, and (ii) using the net asset value to compute the weighted average, this was done following the Lee, Shleifer & Thaler (1991) methodology:

$$Weighted \quad Average \quad DISC = \sum_{i=1}^{n} \left[\frac{NAV_i}{\sum_{j=1}^{n} NAV_j} \right] \times DISC_i$$

*B. Variables (*proxies*) used to test the hypotheses.*

Liquidity

We use the following proxies for liquidity:

i. Ratio between monthly traded volume of investment company shares and monthly traded volume of the stocks in the portfolio.

The numerator is obtained from the monthly bulletins of the Santiago Stock Exchange. To build the denominator we use the volume traded of the stocks held by the Investment Company, where the weights are proportional to the market capitalisation of the investments[18].

ii. Ratio between number of days that the Investment Company trades its stocks and the weighted average number of days that the investment company assets trades.

The information to build this ratio is obtained from monthly bulletins published by the Santiago Stock Exchange[19], and the weights used to compute the denominator are proportional to the MC of each investment.[20]

[18] The amount traded by privately held companies is by definition zero.

[19] It does not include privately held companies since they are not traded in the stock market.

[20] For example, the market capitalisation of the investment portfolio maintained by Luz and Fuerza in March 1999 corresponds to $120,613,692. The companies with an exchange stock quotation in this portfolio are Enersis and Chispa Dos and the corresponding market values invested in these companies are $114,825,889 and $5,555,500. Therefore, the proportions invested in Enersis and Chispa

iii. Percentage of privately held companies in the portfolio of investment companies.

This corresponds to the book value of the private companies held by the Investment Company divided by its NAV.

Corporate Control

The proxy for this variable is defined as:

Percentage of participation of the five major shareholders in the investment company

We obtain this information from the "FECUS" reported by the Superintendencia de Valores y Seguros in Chile[21].

Productive versus investment companies

The following variable was defined:

NAV of filiate and related companies over NAV of the Investment Company.

Investment in filiated and related companies is understood to be those investments that are maintained for one year or more and represent at least ten percent of the equity of the issuing companies. In the Balance Sheet this corresponds to the item Other Assets.

Dos are 95.20% and 4.61% respectively (they do not add 100% because there is a small investment in closed companies). These proportions are multiplied by the monthly stock exchange presence of the said companies (100% and 13.04%), that is obtained by adding the results of the value of the denominator of the variable (95.8%). The value of the numerator corresponds simply to the monthly marketable security presence in March of Luz y Fuerza (17.39%). Therefore, the value of the variable built for March 1999 is 17.39%/95.8% equal to 18.15%.

[21] The twelve major shareholders are public information. In fact, we do not find any significance difference in using either of them.

Intermediate Investment Companies

The following proxy was utilised:

Proportion invested in Investment Companies

This variable corresponds to the ratio between the market capitalisation of investment companies and the total NAV of the Investment Company.

Investment in Private Companies

The following proxy was used:

Percentage invested in Private Companies

The private companies are at book values.

Pension Funds Regulation

It is used:

Depurate Book Value of Assets over Book Value of Assets

If it is less than 40 percent the Pension Funds are not allowed to buy stocks of the Investment Companies. In this takes the ratio is defined as zero.

5. Statistical Results

A. *Premiums and discounts of Investment Companies*

Table 1 reports the premiums and discounts of investment companies, using two different methodologies, for Sample A. In methodology 1 (M1) private investments are considered at book value, and in methodology 2 (M2)

we compute a proxy of market value for private companies based on the ratio between market and book value of comparable public firms. We consider the SIC Code made by Chilean Electronic Stock Exchange (Bolsa Electrónica de Chile) which classifies the stocks in four sectors (Power, Industrial, Natural Resources and Services). We use the following formula to compute the proxy of market value for Private Companies:

$$MCP_i = BV_i \times \left(\frac{1}{N}\right) \times \sum_{j=1}^{N} \frac{MC_j}{BV_j}$$

Where,

MCP is market capitalisation proxy, BV is book value of assets, MC is market capitalisation and N is the number of companies that belong to the SIC Code.

Also, for both methodologies, premiums and discounts averages (simple and weighted) are reported.

As can be seen in Table 1, in almost every case the discount of the investment companies is underestimated when the private investments are computed at their book value[22]. For this reason, when M1 is applied, six companies have a premium (simple average or weighted average), but only four have a premium using M2. Also, the average discount of investment companies for Sample A is estimated as 8,22 percent (simple average) with M1, but as 27,89 percent (weighted average) in M2. The contrast is still greater if discounts are computed using weighted averages. In this last case the average premium is 4,4 percent following M1, but the average discount is 27,9 percent following M2.

It is useful to consider that the distinction between weighted and simple average is not relevant if methodology 2 is followed, in which case the averages of the discounts are not significantly different.

As the onset of the Asian crisis occurred in mid 1997, the Zivot and Andrews Test was also conducted to investigate data structural changes because our data set corresponds to the period 1993-1999. The Test did not detect any structural changes[23].

[22] The only exception is CAP.

[23] In the majority of companies evidence was not found that such a break was produced, and when some evidence of a break was found, the dates did not correspond to the period of the Asian crisis for none of the companies of the sample.

B. *Econometric Results*

We used the methodology of Panel Data (Pool Least Squares Data Method), because this allows the combining information of heterogeneous agents (companies) through the time, which has clear statistical advantages[24]. Furthermore, there is empirical evidence for Chilean stock market that monthly returns show autocorrelation (see Urrutia, 1994). Since we have a small sample, we are not able to show cross-sectional estimations.

In terms of sample selection, it is not possible to build explanatory variables in the case of companies whose investments are only in private companies, this criterion leaves 18 companies in the sample.[25] Furthermore, we exclude from the sample Bicecorp since its independent variables are practically without variation in the sample period, making impossible to estimate the model. We denote by Sample B, this resulting group of 17 companies.[26]

Considering that the companies in the sample belong to different economic sectors, we suspected the presence of industry factors that might provoke heteroscedasticity. Besides, since all the companies as a group are affected by those macroeconomic variables, a correlation could be generated among companies. However, no evidence was found,[27] neither did we detect heterocedasticity inside companies (White Test), although we did find autocorrelation, shown by the coefficient of partial correlations.

[24] The simultaneous estimation with the 73 crossed sections (that is to say, with all the Pool Least Squares Data), enlarges the efficiency of the estimators obtained, since it makes allowances for the fact that the agents (companies) in each crossed section are the same. In addition, having 73 observations (73 months) for each agent, it is possible to utilise this temporary dimension to obtain consistent estimations of the econometric model.

[25] The simple discount average and weighted average, calculated under methodology 2, for this group of companies are –29.72% and –19.55%, respectively.

[26] The simple discount average and weighted average, calculated under methodology 2, for Sample B are –24.6% and -13.6%, respectively.

[27] To determine the presence of heterocedasticity among companies, the coefficients obtained through a panel in which is imposed the heterocedasticity were compared with the coefficients obtained through a second panel in which we suppose homocedasticity; the results did not show significant differences. Likewise, to determine the existence of autocorrelation among companies, we compared the coefficients obtained through a panel in which heterocedasticity and autocorrelation among firms were assumed simultaneously, with the coefficients obtained through a second panel in which we suppose only that heterocedasticity exists; the results being that they did not differ significantly.

We also conducted the Hausman Test to determine what model of Pool Least Squares Data should be used (fixed effect or variable effect); the sample was consistent with the model of fixed effects. This effect is captured utilising a different intercept for each of the different companies.

In summary, on the base of the above analysis we choose the fixed effect model because it considers homocedasticity, not only of the companies but also the presence of autocorrelation.

The proxies discussed in the previous section are included in the following Regression:

$$DISC_i = \alpha_{it} + \beta_1 INS_i + \beta_2 IRC_i + \beta_3 STV_i + \beta_4 SMP_i + \beta_5 PHC_i + \beta_6 IIC_i + \beta_7 DBA_i + \beta_8 AR(1)_{it} + \varepsilon_{it}$$

Where:

DISC = premium (if positive) or discount (if negative) to investment companies.
INS = percentage of property in the hands of 5 most important shareholders (insiders).
IRC = percentage invested in filiated and related companies.
STV = traded volume related to the portfolio.
SMP = Stock Market presence related to the portfolio
PHC = percentage invested in privately held companies
IIC = percentage invested in investment companies
DBA = Depurate Book Value of Assets (0, if smaller to 40 percent)

In this regression we incorporate all the explanatory variables suggested in this study adding the term AR(1) to correct for problems of autocorrelation inside each company. The objective of estimating this Regression is to find a coefficient for each of the independent variables, so that this coefficient captures the "global" effect of each variable upon the premium or discount of the Investment Companies in Chile.

In Table 2 we report the results of the econometric regression. The variables explained 83 percent of the discounts to investment companies, and

four of the variables are statistically significant to the 10 percent level, corroborating four hypotheses.

Hypotheses supported by the data are: insider ownership (percentage of shares held by the five largest shareholders), permanent character of the investment (investment in filiated and related companies) and regulation of the Pension Funds (Depurate Book Value of Assets). In addition, if DBA[28] is excluded, the hypothesis of liquidity is supported (and is statiscally significant at 8 percent). This suggests that DBA capture in part (as it is reasonable) the liquidity of the investment. It is also interesting to note that if DBA is introduced as a dummy variable (0, if smaller than 40 percent and 1 otherwise), it does not become significant, maintaining the sign and statistical significance of the other explanatory variables included in the regression. There are two potential explanations. First, this result may reinforce the idea that this variable captures other factors besides the regulatory one, for example, the possibility of different series of stocks, some of them with preferential rights to select a greater number of directors. Second, it is possible that the continuous measure of DBA is a better proxy to capture the probability of becoming an uneligle stock (less than 40 percent).

Finally, the hypothesis upon intermediate investment companies was corroborated, in the sense of the explanation associated to agency problems between outsiders and insiders. This hypothesis is doubly corroborated since a greater discount exists when the ownership of the largest shareholders (corporate control) is more concentrated.

6. Conclusions

In this paper we have studied basically two aspects related to investment companies. First, if their prices are consistent with its net value of assets. Secondly, what are the determinants of the difference that either may explain discounts or premiums. We consider a sample of investment companies in the period December 1993-December 1999. An average discount to investment

[28] It was carried out a Test of Excluded Variables, being concluded that it is possible to exclude it.

companies in Chile of 28 percent was found for the most extensive sample of 22 companies (Sample A).

Subsequently, we explored six hypotheses to understand the structure of discounts found: liquidity, corporate control, degree to which they are investment companies, existence of intermediate investment companies, investment in private companies, and regulation of pension funds. The results of the Pool Least Square indicate that 83 percent of the premiums and discounts are attributable to four variables: corporate control, degree to which the investment companies are investment companies, intermediate investment companies and Pension Funds Regulation. If this last variable is excluded, the hypothesis of liquidity becomes significant (to 8 percent). Thus, four hypotheses were confirmed. The discount to investment companies is greater if:

- the insider ownership is more concentrated (insiders can maximise its own welfare to the detriment of outsiders);
- the investment in filiated and related companies is smaller (more investment than productive company);
- the investment in other Investment Companies is smaller (agency problems among insiders and outsiders), and
- the greater the regulatory restrictions on Pension Funds investments (while the DBA is smaller).

Table 1

Premiums and Discounts of the Investment Companies (Sample A)

Company	Discount Simple Average (M1)	Discount weighted average (M1)	Discount Simple Average (M2)	Discount weighted average (M2)
Almendros	-33.40%	-33.48%	-33.40%	-33.48%
Antarchile	-29.65%	-32.01%	-99.75%	-69.94%
Bicecorp	-48.86%	-49.12%	-97.71%	-49.12%
Calichera	-30.14%	-31.55%	-36.46%	-37.00%
Campos	-28.95%	-29.30%	-27.92%	-28.96%
Cap	2.30%	-3.10%	23.35%	4.10%
Cementos	106.99%	68.47%	-12.04%	-9.38%
Chilquinta	22.80%	13.24%	15.64%	5.40%
Chispa dos	-30.86%	-31.20%	-30.86%	-31.20%
Chispa uno	-30.92%	-31.27%	-30.92%	-31.27%
Cmpc	-3.81%	-8.85%	-29.04%	-34.48%
Copec	41.86%	32.93%	7.64%	5.36%
Enersis	22.72%	21.01%	0.90%	-4.35%
Indiver	-22.99%	-23.91%	-31.70%	-32.15%
Inforsa	-29.35%	-30.72%	-35.22%	-34.58%
Luz y Fuerza	-25.32%	-29.95%	-25.32%	-29.95%
Marinsa	-30.98%	-31.20%	-30.98%	-31.20%
Minera	-9.07%	-12.97%	-28.38%	-32.31%
Nortegrande	-6.34%	1.83%	-7.40%	0.40%
Oro blanco	-15.09%	-9.18%	-22.07%	-16.62%
Pasur	-21.07%	-22.62%	-27.20%	-28.16%
Vapores	19.25%	10.10%	-54.79%	-56.83%
Average	-8.22%	4.40%	-27.89%	-27.91%

Table 2
Econometric Results

The table shows the results applying an estimation of MCO with fixed effect to the Data (Pool Least Squares with fixed effect) from December 1993 to December 1999, to the sample of 17 investment companies, that implies 61 included observations and a total of 1012 observations. The convergence was reached after 17 interactions.

Variables	Factor	Test t	Fixed effect	Test t
INS	-0.129787	-1.950626*	ALM—C	-1.818118
IRC	0.253141	2.091345*	ANT—C	-1.12301
IIC	1.26103	4.643354*	CAL—C	-0.859586
STV	1.70E-09	0.430301	CAM—C	-0.498382
SMP	0.065981	1.511887	CHI—C	-0.832754
PHC	0.161562	1.083436	CH2—C	-1.780404
DBA	1.159064	2.927993*	CH1—C	-1.791057
ALM—AR(1)	0.735239	4.24411	CMP—C	-1.425013
ANT—AR(1)	0.863957	3.849861	COP—C	-0.741518
CAL—AR(1)	0.963926	19.32632	ENE—C	-0.972061
CAM—AR(1)	0.727405	6.52841	IND—C	-0.552092
CHI—AR(1)	0.663046	11.53652	LYF—C	-1.959532
CH2—AR(1)	0.732808	4.942088	MAR—C	-1.727821
CH1—AR(1)	0.717998	3.975622	MIN—C	-0.722885
CMP—AR(1)	0.802298	4.990997	NOR—C	-1.387658
COP—AR(1)	0.869257	15.40857	ORO—C	-1.556187
ENE—AR(1)	0.766082	9.385302	PAS—C	-1.428737
IND—AR(1)	0.898136	7.487513		
LYF—AR(1)	1.089345	21.05095		
MAR—AR(1)	0.460106	5.423961		
MIN—AR(1)	0.920818	8.508438		
NOR—AR(1)	0.596204	12.12328		
ORO—AR(1)	0.75307	10.33893		
PAS—AR(1)	0.913689	7.719357		

R-squared	0.830735	Mean dependent var	-0.233745
Adjusted R-squared	0.823762	S.D. dependent var	0.269313
S.E. of regression	0.113059	Sum squared resid	12.4117
Log likelihood	1722.323	F-statistic	207.1988
Durbin-Watson stat	1.996023	Prob(F-statistic)	0.00

* statistically significant at 5 percent.

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