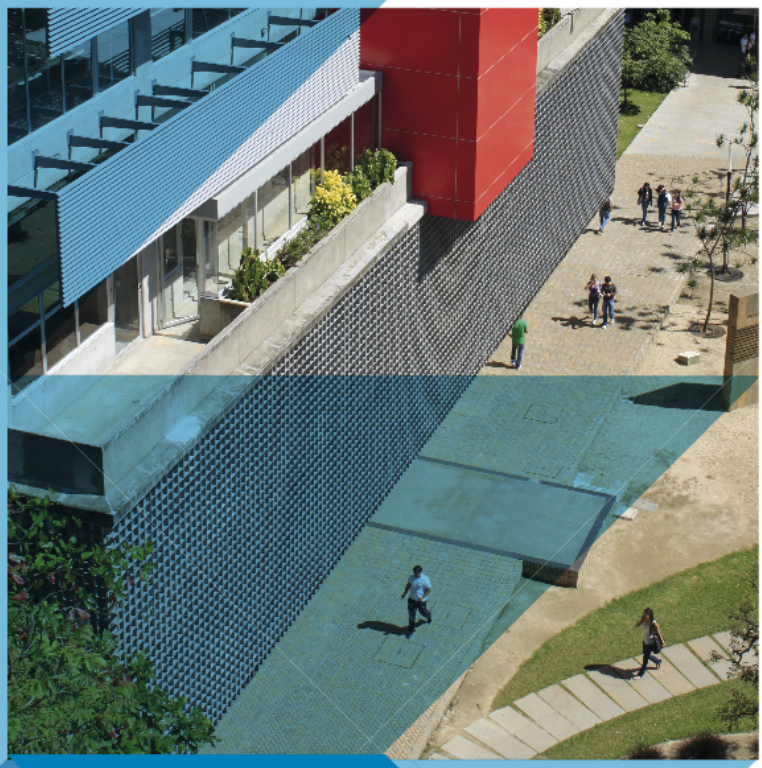

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Corporate governance and transaction cost economics: A study of the equity governance structure

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CORPORATE GOVERNANCE AND TRANSACTION COST ECONOMICS:

A STUDY OF THE EQUITY GOVERNANCE STRUCTURE

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Abstract

This paper examines the Transaction Cost Economics (TCE) theory of capital structure and finds that for the case of equity the usual TCE logic is not fully worked out. In particular, an analysis of the key issue of bilateral dependency between the firm and its shareholders is absent. To fill this gap in the literature, the paper further develops the theory of the equity governance structure by taking account of the concept of bilateral dependency over the lifecycle of the firm. The paper finds that, both theoretically and empirically, contractual hazards are indeed mitigated for the case of fast growing young firms which are dependent on shareholders to finance future growth. In contrast, for the case of mature firms, which in virtue of their large free cash flows are independent from shareholders, contractual safeguards are altered to the disadvantage of shareholders and consequently managerial discretion costs increase.

KEYWORDS: Corporate Governance, Transaction Cost Economics, Free Cash flows, Firm Valuation

JEL CLASSIFICATION: D23, G31, G32, G34

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1. INTRODUCTION

In contrast to traditional theories of capital structure, Transaction Cost Economics (TCE) holds that debt and equity are alternative governance structures and that their use to finance individual investment projects will depend on the characteristics of the assets required to undertake those projects (Williamson, 2008, 2002, 1996, pp. 171-194). In particular, TCE emphasizes the concept of "specific assets", that is, assets that would lose most of their productive value if the project failed and they had to be redeployed to the second best use. Thus, TCE argues that if the requisite assets are non-specific, then debt is the appropriate governance structure to use in order to finance the project. On the other hand, if the necessary assets are highly specific, then the use of the equity governance structure is warranted.

Thus far the empirical literature has largely corroborated these predictions of the TCE capital structure theory (Titman and Wessels, 1988; Balakrishnan and Fox, 1993; Kochhar, 1996; Močnik 2001; Benmelech et al., 2005). However, if we compare the theory with other work in the field of TCE, we find that the basic logic has not been fully developed in particular with respect to the equity governance structure. For instance, consider the paradigmatic "make or buy" decision (Williamson, 2005). In the presence of asset specificity, through the fundamental transformation process, TCE predicts that a situation of bilateral dependency will emerge if the supplier and the buyer decide to sign the contract. Since the parties to the contract live in an uncertain world there is scope for opportunism to emerge when unforeseen disturbances occur. In order to cement the relationship the parties to the contract find that the institution of governance structures buttressed by contractual safeguards is mutually beneficial and therefore decide to institute

them voluntarily. Moreover, there is a clear role for institutions as formal or informal restrictions on opportunism in the background of the transaction.

In contrast, the TCE theory of the uses of debt and equity does not fully follow this tried and tested logic. As a consequence, several key issues are not examined in detail. In particular, for the equity governance structure, a discussion of the central issue of *bilateral dependency* in the presence of specific assets is noticeably absent and consequently important questions are left unanswered: will the managers of the large modern corporation, with its large internal cash flows, depend on shareholders for the financing of non-redeployable assets? Are shareholders, who can sell their shares anytime, dependent on the corporation? If bilateral dependency does not take place at all times, will the governance structures in place effectively prevent opportunism from occurring? If opportunism occurs, in which form(s) will it likely be manifested? Moreover, what will be the role of *institutions* in mitigating opportunism? In sum, the theoretical treatment of the equity governance structure clearly requires a more in-depth analysis of the processes involved.

The objective of this paper is to fill this gap in the literature by providing a more complete theory of the equity governance structure as well as empirical assessments to back the testable predictions derived thereof. Thus, taking proper account of the concept of bilateral dependency and of the notion that the financial situation of the firm changes in predictable ways over the firm's lifecycle (Mueller, 2003, pp. 80-82), this paper concludes that contractual hazards are indeed mitigated for the case of fast growing firms whose managements are dependent on shareholders to finance future growth. On the other hand, the analysis suggests that for the case of mature firms with large free cash flows and few

growth opportunities contractual safeguards such as the board of directors will lose effectiveness and unconstrained opportunism will emerge as the firm becomes financially independent from its shareholders. When these two predictions are tested empirically the results indicate that increased managerial discretion costs are a characteristic of mature firms. Conversely, the evidence is consistent with relatively low managerial discretion costs for the case of young companies.

The rest of this paper is organized as follows: section 2 reviews the TCE theory on the uses of debt and equity, employs the basic TCE logic to fully develop the theory of the equity governance structure and states the main testable propositions of this paper. Section 3 discusses the econometric specifications to test the theory´s predictions. Section 4 describes the data and presents the econometric results. Section 5 concludes.

2. A NEW LOOK AT THE EQUITY GOVERNANCE STRUCTURE

In this section we take up the theoretical discussion on corporate finance where Williamson (2008, 2002, 1996, pp. 171-194) left off and attempt to develop it further by considering the key issue of bilateral dependency in the presence of specific assets. Our objective is to provide a more complete theoretical treatment of the equity governance structure.

As in other applications, for the case of debt and equity as governance structures, TCE appeals to the "efficient alignment hypothesis to predict which transactions go where" (Williamson, 2010). According to this hypothesis "transactions which differ in their attributes, are aligned with governance structures, which differ in their cost and

competences, so as to effect a (mainly) transaction cost economizing outcome" (Williamson, 2010, 2005). Figure 1 illustrates the key points of the efficient alignment hypothesis for the case of the uses of debt and equity. On the left hand side of the figure we have included two transactions which mainly differ in their degree of asset specificity. As in previous TCE work, we let k denote a measure of transaction-specific assets, and we use $\overline{k}$ to represent the switch over value where parties to a transaction are indifferent as to the choice of debt and equity.

[Insert Figure 1 here]

Moreover, on the right hand side of Figure 1, we portray debt and equity as governance structures which differ in their setup and ex-post costs and in their degree of flexibility to adapt to unforeseen disturbances. Thus, while debt is rules-based and consequently has a low degree of flexibility to adapt to unexpected disturbances (default leads to liquidation), it has relatively low setup costs. On the other hand, equity has higher setup and ex-post costs than debt but it is more flexible in that it features safeguards (which following previous literature we denote with the letter '*s')* mainly in the form of a board of directors that is awarded to the shareholders.

As shown in Figure 1, according to the efficient alignment hypothesis transaction costs are economized when transactions featuring low asset specificity ($0 < k < \overline{k}$) are financed using debt, while transactions characterized by a high degree of asset specificity ($k > \overline{k}$) are financed with equity. If the adequate alignment does not occur, TCE predicts that the transaction will be unstable contractually. For instance, if highly specific assets are to be financed with debt far sighted debt-holders will figure out that the value of their preemptive

claims are low and will require a high risk premium. The firm in turn, in view of these excessively high financing costs, may attempt to realign the transaction by replacing the specialized assets for more re-deployable ones, but this would cause production costs to increase or quality to decline (Williamson, 1996, p. 184). In contrast, if a transaction characterized by low asset specificity is financed with equity TCE predicts that both setup and ex-post costs will be much higher than optimal, and consequently a leveraged buyout would be the manner in which market forces would realign the transaction to a more economical governance structure (Williamson, 1996, pp. 190-192).

Up to this point we have given an account of the basic TCE argument on the uses of debt and equity. We concur with the arguments so far and note again that the empirical literature has been largely corroborative. However, if we compare the canonical renditions of TCE with the arguments on the uses of debt and equity (particularly Williamson 2008, 2002, 1996, pp. 171-194) we find that there is basically no discussion on the key issue of bilateral dependency. We propose to fill this gap with the theoretical treatment below.

We start our discussion by observing that, taken as a group, shareholders will always depend on the firm (more precisely the party in control of the firm e.g. the entrepreneur or the professional management) to take good care of their resources invested therein. Although individual shareholders can end their connection with the firm by selling their shares, they will usually sell it to other members of the public. The upshot is that, as long as the corporation does not buy back its own equity, the investing public taken as a group will hold the corporation stocks at all times, will be dependent on the firm, and will not be able to terminate the contractual relationship (Williamson, 1985, pp. 304-306).

In contrast, work on the lifecycle of the firm such as that developed by Mueller (2003, pp. 80-82) suggests that the firm will not always be financially dependent on the shareholders to fund investments in highly specific assets. According to firm lifecycle theory, young firms are characterized by rapid growth and by the fact that their positive net present value investment opportunities will generally exceed its internal cash flows. For our present purpose this means that, since the funding as a rule will not be obtainable from internal cash flows, young firms will be dependent on shareholders to finance the specific assets necessary for the growth of the firm. Moreover, it is important to note that as young firms are usually perceived as being riskier than older well established corporations, lenders may be slow to provide the funds and this would tend to increase the company's dependence on shareholders. On the other hand, according to lifecycle theory the corporation's cash flows continually grow over time while its investment opportunities tend to decline. Thus, for mature firms, the budget to fund positive net present value investment opportunities eventually becomes smaller than internal cash flows. This suggests that mature companies will be independent from its shareholders since the funding needed for investments in specific assets will be attainable from retained cash flows. Moreover, as older well established companies are likely to be perceived by lenders as representing a safer bet, the cost of debt for these firms will tend to be lower and this will also tend to increase the corporation's financial independence from shareholders. Thus, from the foregoing, we conclude that bilateral dependency will hold for the case of fast growing young firms while, in contrast, bilateral dependence will not occur for the case of slow growing mature firms.

Now, based on the insight that the intensity of bilateral dependency between a firm and its shareholders weakens over time, in what follows we develop a theoretical account for the equity governance structure which we illustrate with the help of Figure 2. As can be seen on the figure, the horizontal axis represents firm age while on the vertical axis we portray the cost of managerial discretion. In the graph we represent bilateral dependency with the letter *b*, and as in the previous figure safeguards are denoted with the letter *s*. We begin our argument by considering the case of a fast growing young firm that is dependent on its shareholders for the financing of specific assets needed for growth, which we designate "case A" on the left hand side of the figure. As discussed above, the shareholders will also be dependent on the firm and thus it is clear that, in this case, bilateral dependency will be strong ($b >> 0$). Thus, case A corresponds to the usual situation described in TCE where it is beneficial for both parties to institute strong safeguards, in the form of an effective board of directors ($s >> 0$), "to infuse order … mitigate conflict and realize mutual gains" (Williamson 2005). Clearly, in this case the contractual relationship will be characterized by low managerial discretion costs and the costs of new equity capital to fund investments in specific assets will be relatively low.

[Insert Figure 2 here]

The contractual relationship changes fundamentally as the firm matures and becomes financially independent from its shareholders (case B). If the corporation can rely on its cash flows to fund those projects which involve specific assets and in addition it must pay out part of its earnings as dividends to shareholders then it is likely that insiders in control of the firm (professional management being the typical case) will increasingly view shareholders as a functionless party that only drains the resources available to the firm. This

event would evidently mean the end of the bilateral dependency situation ($b = 0$). Thus taking into account the fundamental TCE behavioral assumption of opportunism it is logical to expect that the party in control of the corporation will likely alter the composition of the board of directors to the disadvantage of the shareholders. Moreover, with these changes it can be expected that managerial discretion costs would increase as shown in Figure 2. For instance, the management may start consuming more perquisites (Jensen and Meckling, 1976) or it may decide to reduce the dividend (Jensen, 1986; Mueller, 2003, pp. 80-82). However, there is good reason to expect that for case B the board of directors would still safeguard the investments of equity-holders to a certain extent. In particular, if shareholder dissatisfaction with management is too great the stock price may plummet and although management may be no longer interested in issuing new equity, the fall in the share price may increase the likelihood of a hostile takeover. With the takeover outsiders would gain control of the board of directors and may dismiss the management staff. Thus, although managerial discretion costs would increase compared to the situation in case A, we expect that the threat of hostile takeover would keep them to a moderate level.

Finally, recent work on corporate governance (Gompers et al., 2003; Bebchuk et al., 2009) suggests that the control of the corporation can effectively insulate themselves from the threat of a hostile takeover by having the board of directors set up a wide variety of anti-takeover provisions. Now, if such provisions are deployed we reach "case C" in Figure 2, where managerial discretion costs increase to the point that only the institutional constraints (e.g. legal shareholder protection, monitoring by the financial press) would protect shareholder assets. Unfortunately for shareholders although these institutional constraints may mitigate stealing, they are unlikely to be effective against the reduction of

the dividend, or investment in negative net present value "pet projects" that management may decide to implement. This is because (in the context of US institutions) the courts are unlikely to second guess such business decisions (Shleifer and Vishny, 1997).

The foregoing discussion suggests the following testable propositions: (i) as bilateral dependency between the firm and its shareholders weakens the costs of managerial discretion will tend to increase; therefore financially dependent firms (case A) should be valued more highly by the market than financially independent firms (case B). (ii) As financially independent firms deploy anti-takeover provisions the costs of managerial discretion would tend to rise even more, hence financially independent firms (case B) should be more valuable than similarly independent firms when the latter also have a large number of anti-takeover provisions in place (case C).

3. ECONOMETRIC SPECIFICATION

In testing the abovementioned propositions empirically, we use *Tobin's q* as the measure of firm value, which we regress on a measure of bilateral independence, an anti-takeover provisions index and control variables which are standard in the corporate governance and firm value literature (Morck et al., 1988, Bhagat and Black, 2002; Brown and Caylor, 2006, Bebchuk et al., 2009). In particular, the following regression equation is estimated:

$$Tobin'sq_{it} = \beta_0 + \beta_1 Aindex_{it} + \beta_2 Eindex_{it} + \beta_3 CF_{it} / totalassets_{it} + \beta_4 salesgrowth_{it} + \beta_5 firmsize_{it} + \beta_6 leverage_{it} + \beta_7 firmage_{it} + \sum_{j=1}^{J-1} \lambda_j Industry_{ij} + \sum_{t=1}^{T-1} \theta_t Time_{it} + \varepsilon_{it} \quad (1)$$

Where, *Tobin's q* is calculated as the ratio of the market value of a given firm at the end of year *t* divided by the book value of its total assets at the end of year *t*. Moreover, the right hand side of Eq. (1) takes into consideration the corporate governance factors discussed in our theoretical section, by including, an index of firm financial independence from shareholders the "*A-index"*[3] developed by Saravia (2014) and the index of anti-takeover provisions "*E-index*" (entrenchment index) proposed by Bebchuk et al. (2009).[4]

As explained by Saravia (2014), the *A-index* is constructed by comparing a firm's annual cash flows with the funds it raises through new equity issuance and retained cash flows over the same period (CF *vs.* ΔE + CF - Dividends). Following firm lifecycle theory (Mueller, 2003, pp. 80-82), the author argues that financially dependent firms will tend to be young companies that issue a substantial amount of new equity and pay no dividends so that their CF will usually be smaller than their level of investments in specific assets funded using new equity and retained cash flows (CF < ΔE + CF - Dividends). In contrast, financially autonomous firms will tend to be mature corporations that issue very little new equity and pay dividends, so that their CF will be usually greater than their level of investments in specific assets funded using new equity and retained cash flows (CF > ΔE + CF - Dividends). Furthermore, to mitigate the impact that the business cycle has on the firm's cash flows and investment opportunities, the comparison is performed over a period of seven years. In particular, the *A-index* for a given company in a given year '*t*' is constructed by adding one point for each year in which a company has greater cash flows than investments funded with equity plus retained cash flows. Since the comparison is performed over the 7 years prior to *t*, the A-index ranges from 0 to 7. Clearly, firms that are

[3] The "A-index" stands for financial autonomy index.
[4] See the appendix for details on the calculation and sources of data for all variables in Eq. (1).

financially independent from their shareholders obtain a higher score in this index relative to those that are financially dependent on their shareholders.

In addition, we employ Bebchuk et al.´s index of anti-takeover provisions to measure managerial entrenchment. We prefer this index to other alternatives since it is constructed using a more analytic approach than other indices available in the literature. Rather than including every single anti-takeover provision in their index, Bebchuk et al. (2009) base the inclusion of each provision on discussions with lawyers, their own personal analysis and the examination of provisions that attract opposition from institutional investors. The *E-index* comprises six key governance provisions: staggered boards, limits to amend by-laws, poison pills, golden parachutes, supermajority requirements for mergers, and supermajority requirements for charter amendments. The index is created for a given firm in a given year by assigning a point for each of the six key provisions that the firm has. Thus, the *E-index* ranges from 0 to 6.

We expect that there will be a negative relationship between *Tobin's q* and both firm financial independence from shareholders as measured by the *A-index* and managerial entrenchment as measured by Bebchuk et al.'s (2009) index of antitakeover provisions. The reason is that, as mature firms become financially independent and antitakeover provisions are eventually increased in number, the cost of managerial discretion will tend to increase, which in turn will be reflected in a relatively low *Tobin's q*.

Moreover, several additional standard control variables are included in Eq. (1). The first of these variables, i.e. *CF/totalassets*, is the firm cash flow during year *t* divided by the firm total assets at the end of *t*. It is expected on a priori grounds that this variable will have

a positive sign. The key idea behind this variable is that a firm with a large cash flow should be more valuable and have a lower risk of default. It may be argued that a large cash flow may be negatively related to firm value due to the agency costs of free cash flows (Jensen, 1986). However, it is only when the cash flows are larger than the amounts needed to fund all positive net present value projects that conflicts of interest manifested in over-investment can occur, and in Eq. (1) this effect is already captured by the *A-index* (Saravia, 2014). Thus, in this paper the positive effect for a firm`s market value of having a large cash flow is captured using the *CF/totalassets* variable in Eq. (1), while the negative effect of having "free cash flows" is captured by the *A-index*.

Additionally, the control variable *salesgrowth* is included in Eq. (1). In an influential article, La Porta et al. (2002) argue that firms with better investment opportunities should have higher *Tobin's qs*. To control for investment opportunities these researchers included a sales growth variable in their regression equation which was highly significant. Hence, a sales growth variable is also included in the firm valuation regression equation above. This variable will be measured as the percentage change in the firm's total sales between the end of year *t-1* and the end of year *t*. Based on La Porta et al.'s (2002) arguments it can be expected on a priori grounds that there will be a positive relationship between *salesgrowth* and *Tobin's q*.

The next control variable included in Eq.(1), *firmsize*, is measured as the natural logarithm of the book value of total assets at the end of year *t*. In this paper the rationale behind the inclusion of *firmsize* as a control variable is that traditionally (i.e. before the mid-1980s in the U.S.) large firm size used to be considered a sufficient anti-takeover defense to allow managements to substantially over-invest without the fear of a hostile

takeover (Mueller and Reardon, 1993), and this in turn tended to reduce firm valuations. Thus, this variable is expected to have a negative sign. It should be pointed out however that, following the hostile takeover wave of the 1980s large firm size may not be an effective takeover deterrent anymore, and therefore it is likely that this variable may be insignificant for samples taken from more recent periods.

Next, we include a standard control that the corporate governance literature has used in Tobin's q regressions. Namely *leverage*, which is measured as the ratio of the book value of a firm's total debt to its total assets. Previous work has reported a negative and highly significant relationship between *leverage* and *Tobin's q* (Bebchuk et al., 2009), which is also expected in our empirical tests.

Furthermore, firm age is included as a control variable in Eq. (1). For the reasons given in section 2 above, we expect that *firmage* will have a negative sign. This variable will be measured as the natural logarithm of the number of years since the company's incorporation.

Eq. (1) also includes a set of industry dummy variables. These dummy variables have been included in firm valuation regression equations since Morck et al. (1988) to control for possible spurious correlation between corporate governance variables and *Tobin's q*. The rationale for the inclusion of the industry dummy variables in Eq. (1) is the following: since *Tobin's q* is usually computed by dividing market value of the firm by the book value of the firm's total assets, companies in industries with a greater proportion of intangible assets will have a higher *Tobin's q* when compared to firms in industries with a greater

proportion of tangible assets. To control for this difference between industries the inclusion of industry dummy variables is required.

Lastly, Eq. (1) includes time dummy variables to deal with time fixed effects. The latter follows recent work by Petersen (2009) on the appropriate econometric methods to employ when using panel datasets in corporate finance. In particular, Petersen's paper shows that in order to avoid important pitfalls associated with traditional panel data methods, a pooled regression with time dummy variables and standard errors clustered by firm can be used. This will be the approach we will follow in the next section.

4. DATA AND ECONOMETRIC RESULTS

4.1. Sample selection

We started with Bebchuk et al.'s (2009) *no dual class* stock *E-index* database which contains entrenchment data on U.S. firms for the years 1990, 1993, 1995, 1998, 2000, 2002, 2004 and 2006. Using Datastream, we then searched for firms in Bebchuk et al's database which are not in the banking and financial industries (SICs 6000 to 6999) or in certain service industries (above 8100) and that were active between 1990 and 2004. The objective behind these criteria was to obtain a sample of firms with a long time series of data with which to build the variables in the model and in addition, to exclude companies whose capital and investment are fundamentally different to those of most firms in the sample. Using these criteria we obtained a list of 475 firms. Following the usual practice in corporate governance studies, observations for the years in which governance provisions data is not available were filled in by assuming that the provisions remain unchanged until

the next year with available data (e.g. Gompers et al., 2003; Bebchuk et al., 2009; Bebchuk et al., 2013). In this way, we are able to assign values for the 475 firm's *E-indices* for a period of 19 years, from 1990 to 2008. Market prices and accounting data for the firms in the sample were obtained from the Datastream database as described in the Appendix.

4.2. Sample description

Table 1 presents summary statistics for the empirical variables. As shown, the firms in the sample contain substantial variation in their age, valuation, entrenchment index, financial independence and other variables of importance for testing our hypotheses.

[Insert Table 1 here]

It has been pointed out in the literature that samples constructed using as a starting point the Investor Responsibility Research Centre (IRRC) information are likely to contain a substantial amount of large companies. This is because firms that are relevant from the IRRC perspective are traditionally those in the Standard & Poor's (S&P) 500 as well as the annual lists of large corporations in the publications of Fortune, Forbes, and BusinessWeek (Gompers et al., 2003). Since the database in this paper takes as its starting point Bebchuk *et al.*'s (2009) *E-index* database which is based on the publications of the IRRC, there is a danger that our database contains large firms only. However, inspection of the sample reveals that it contains a number of small firms as well.

[Insert Figure 3 here]

As shown in Figure 3, although the sample does contain a number of very large firms e.g. there are more than 500 firm-year observations in which company total assets are

beyond the US$ 25 billion mark, the figure also indicates that the sample contains a number of small firms as evidenced by the fact that there are over 1000 firm-year observations in the sample where firm total assets are less than US$ 500 million.[5] Overall, inspection of Figure 3 reveals that the sample is not restricted to the very largest firms; instead the figure shows that the sample contains a reasonably varied range of company sizes.

Similarly there is a danger that databases constructed using the information on corporate governance provisions published by the IRRC may only contain older companies as measured by firm age. This is because older firms are usually also very large. Thus, a sample composed of large firms may also contain a substantial number of older firms. However, inspection of the sample reveals that it contains a reasonably varied range of company ages. As shown in Figure 4, although the database does contain a number of old companies, the figure also indicates that the sample contains a number of young firms as evidenced by the fact that there are over 1000 firm-year observations in the sample where firm age (measured in years since company incorporation) is lower than 30 years.

[Insert Figure 4 here]

Correlations between the empirical variables are presented in Table 2. It is interesting to note that the *A-index* presents a significantly positive correlation with *firmage* and a negative and significant correlation with *salesgrowth* (our measurement of investment opportunities). This suggests that, consistent with firm lifecycle arguments, young companies with a low *A-index* present a higher rate of sales growth, which means that young firms have better investment opportunities than mature firms with a high *A-index* and low sales growth. In addition, the table shows that the *A-index* has positive and

[5] All relevant ítems are deflated using CPI (2000 = 1).

significant correlations with *firmsize* and *CF/totalassets*. This implies that companies with a high *A-index* are on average relatively larger and have larger cash flows.

[Insert Table 2 here]

Interestingly, while *Tobin's q* presents a significantly negative correlation with the *A-index* it also displays a very strong and significant positive correlation with *CF/totalassets*. This finding indicates that very large cash flows are not necessarily negative for firm valuation; it is the end of the bilateral dependency condition (as measured by the *A-index*) between a firm and its shareholders that increase managerial discretion and not merely the size of the cash flows. In other words, it is only when the cash flows are larger than the amounts needed to fund all positive net present value projects, and consequently firms are financially independent from its shareholders, that conflicts of interest known in the corporate governance literature as the "agency costs of free cash flow" occur (Jensen, 1986).

On the other hand, Table 2 shows that *firmage* presents positive and significant correlations with both the *A-index* and the *E-index*. This implies that as firms mature, and on average become more financially independent, a larger number of consequential anti-takeover provisions are deployed. Moreover, the table indicates that both the *A-index* and the *E-index* have significantly negative correlations with *Tobin's q*. This finding indicates that as firms become more financially autonomous and deploy more antitakeover provisions their valuations tend to decline.

Additionally, Table 2 indicates that both the *E-index* and *firmage* have negative and significant correlations with *salesgrowth*. This suggests that it is not in the fast growing

young firms that managements deploy the most antitakeover provisions; on the contrary, it is in the slow growing mature firms where managements are the most entrenched.

Lastly, it is worth noting the strong positive correlation between *firmage* and *leverage.* Since young firms are usually perceived as being riskier than older well established corporations, a clear explanation for this correlation is that lenders require a higher risk compensation for lending to young firms and consequently young firms tend to rely less on debt and instead issue more equity (i.e. young firms tend to depend more on their shareholders). On the other hand, lenders will likely require lower risk compensation in their loans to mature firms. Accordingly, mature firms can rely more on debt which allows these companies to be more independent from their shareholders.

In conclusion, the sample description above demonstrates that the database contains firms with sufficient variation in their age, sizes and other variables for the purposes of testing the paper's hypotheses. Having elucidated this point, the next section employs the econometric methods discussed above to perform multivariate tests of the hypotheses.

4.3. Econometric results

Table 3 presents the econometric results. Column 1 shows a specification in which *Tobin`s q* is regressed on the *A-index*, the *E-index,* as well as the time and industry dummy variables. Both the *A-index* is negative and significant at the 5% level and the *E-index* is negative and significant at the 1% level as predicted. The implication is that *Tobin's q* declines as both firm financial independence (measured by the *A-index*) and managerial entrenchment (measured by Bebchuk et al.'s (2009) *E-index*) increase. In other words, consistent with our theoretical discussion in section 2, as firms become more financially

independent over their lifecycle and the number of consequential antitakeover provisions increases, managerial discretion costs escalate. In consequence of the higher managerial discretions costs, firm value (measured by *Tobin's q*) tends to fall.

[Insert Table 3 here]

Column 2 presents the results of regressing *Tobin`s q* on the *A-index*, the *E-index,* as well as most controls in Eq. (1) with the exception of firm age. As shown, the coefficient of the *A-index* becomes more significant and with a higher absolute value than in column 1. In particular, note that the coefficient of the A-index is now significant at the 1% level. On the other hand, the absolute value of the *E-index* coefficient becomes noticeably smaller and it is now significant at the 5% level. Interestingly, the variable *CF/totalassets* is positive as predicted and is significant at 1% level. This indicates that firms with a larger cash flow are more valuable. Taking this result together with that for the *A-index* above, we conclude that with the variable *CF/totalassets* we are capturing in our regression the positive effect on a firm`s market value of having a large cash flow, while the negative effect of having "free cash flows" (so often referred to in the corporate governance literature) is captured by the *A-index*. Moreover, *salesgrowth* is positive and significant at the 1% level. This supports the hypothesis that firms with better investment prospects have higher valuations other things equal. In contrast, the *firmsize* variable is insignificant at any conventional level which may indicate that large firm size was not an effective takeover deterrent in the U.S. stock markets the period in question (1990 to 2008). Importantly, we note that *leverage* is negative as predicted and significant at the 1% level. Considering the correlation between leverage and firm age documented in Table 2, our interpretation of this result is not that higher leverage causes lower firm valuation. Rather, our conclusion is that, other things

equal, higher leverage is an indicator of firm maturity. The fact that older firms have relatively lower costs of debt exacerbates firm financial independence from shareholders which results in increased costs managerial discretion. This is what causes the lower valuation. Finally, it is interesting to note that the adjusted R^2 in column 2 is twice as large as that in column 1. This suggests that in the context of U.S. stock markets, the income and growth prospects of firms, as measured by our control variables, overshadow corporate governance variables in explaining firm valuation.

Next, we remove the *A-index* and the *E-index* variables form the regression equation and introduce *firmage* in their place as a measure of the quality corporate governance (column 3). If bilateral dependency declines over the lifecycle of the firm and eventually antitakeover provisions are put in place by the parties in control of mature firm, as we argue in our theoretical section, then there should be a negative correlation between *Tobin's q* and *firmage*. As expected, *firmage* is negative and significant at the 1% level. On the other hand, it is noteworthy that all control variables retain their magnitudes and significance basically unchanged when compared to the previous regression.

Finally, column 4 presents a regression of *Tobin's q* on the full set of variables in Eq. (1). As can be seen, this time although the coefficient of *firmage* shows the predicted negative sign it is insignificant at any conventional level. Comparing the results in columns 3 and 4, it is clear that the introduction of the *A-index* and the *E-index* variables neutralize the significance of *firmage*. Consequently, we conclude that what drives the lower valuation of mature firms is the end of the bilateral dependency condition and the subsequent managerial entrenchment which occur over time, as measured respectively by the *A-index* and the *E-index* variables. Overall, we interpret the results in Table 3 as

consistent with our theoretical propositions stated in section 2. As bilateral dependency between the firm and its shareholders weakens, as measured by an increase in the *A-index*, the costs of managerial discretion escalate. Consequently, financially dependent firms (case A) have higher valuations than financially independent firms (case B). Moreover, as financially independent firms deploy anti-takeover provisions, as measured by the *E-index*, managerial discretion cost rise further, hence financially independent firms (case B) are more valuable than similarly independent firms when their managements are entrenched (case C).

5. CONCLUSION

According to TCE, equity is a governance structure that economizes on transaction costs and effectively cements the relationship between the firm and its shareholders when a firm finances investments that involve specific assets. This paper examines the theory behind this proposition and finds that, for the case of the equity mode of governance, the usual TCE logic is not fully worked out. In particular, the paper finds that in previous work an analysis of the key issue of bilateral dependency between the firm and its shareholders is absent. Taking proper account of the concept of bilateral dependency, the paper concludes that contractual hazards are indeed mitigated for the case of fast growing firms whose managements are dependent on shareholders to finance future growth. On the other hand, for the case of mature firms the paper argues that contractual safeguards such as the board of directors are altered to the disadvantage of shareholders, and consequently managerial discretion costs increase as the firm becomes financially independent from its shareholders.

Consistent with the theoretical section, the empirical section of the paper finds that financially dependent firms have higher valuations than financially independent firms. Moreover, financially independent firms are more valuable than similarly independent firms when their managements are entrenched.

In considering the public policy implications of this paper it is important to revisit the *remediableness criterion*. This criterion states that "an extant mode of organization for which no superior *feasible* form of organization can be described and *implemented* with expected net gains is *presumed* to be efficient" (Williamson, 2010, emphasis in the original). In this sense, assuming that the objective of a public policy maker is to improve corporate governance, then the present work suggests that one effective policy would be to outlaw the deployment of anti-takeover provisions. If this policy were implemented, the effect would be an increase in the strength of the safeguards of the equity governance structure. In consequence managerial discretion in mature firms would be curtailed as the attributes of "case C" equity governance structures are transformed into those of "case B" structures (Figure 2). On the other hand, the present TCE analysis suggests that public policy that aims to curtail managerial discretion further, for instance by requiring a majority of independent directors in the board, is unlikely to succeed. Once bilateral dependency no longer holds equity capital is no longer needed, and managements are likely to prefer relief from the monitoring pressures that come from a strong board of directors. It is not difficult to see how managements can achieve this goal, for instance they could appoint sympathetic independent directors. Thus, we conclude that although managerial discretion costs are higher for "case B" equity governance structures when compared to those of "case A"

structures, the former structures should be deemed efficient according to the remediableness criterion.

APPENDIX

This appendix explains how the variables used in the empirical section were put together and the data sources used in their construction. Since our main source of market and financial data is Datastream, in what follows we present Datastream data-types in parenthesis.

First, we compute *Tobin's q* by dividing the market value of a given firm at the end of year *t* the book value of total assets (wc02999). Where, the market value of the firm at the end of year *t* is calculated by adding the market value of common stock (wc05301 x P) plus the book value of total debt (wc03255) and preferred stock (wc03451). Note that the value common stock is computed by multiplying the end of fiscal year number of shares (wc05301) times the end of fiscal year price per share (P).

Second, the *A-index* is calculated by adding one point for each year in which a company has greater cash flows (wc04201) than investments financed using equity and retained cash flows over the previous 7 years (from *t-7* to *t-1*).[6] To calculate investment

[6] Please note that 201 firm-year observations of the *A-index* (2.3% of de total) correspond to companies floated in the market less than eight years before the first year in our sample (i.e. 1990), so that in these cases the 7 years data to compute the index was not available from datastream. Consistent with firm lifecycle theory, we assumed that these companies were floated in the stock market precisely because of the need to finance specific assets in excess of their cash flows. Hence, we computed the *A-index* in these 201 cases by assigning zero points for each of the years before market listing. We recalculated all the tables in the paper with and without these 201 observations. The results were not affected in their sign, magnitude and level of statistical significance. Thus, we decided to present the results with the 201 observations included in the database.

financed with equity and retained cash flows over year *t* we subtract dividends (wc04551) from cash flows (wc04201) and then add net new equity (the change in the number of shares wc05301 times average share price P over year *t*).

Furthermore, Bebchuk et al.'s (2009) *E-index* is taken from Bebchuk's webpage (available at http://www.law.harvard.edu/faculty/bebchuk/data/shtml). On the other hand, we calculate *CF/totalassets*, by dividing the firm cash flow during year *t* (wc04201) by firm total assets at the end of *t* (wc02999). Next, *salesgrowth* is computed by calculating the annual percentage change in the firm's total sales (wc01001) between the end of year *t-1* and the end of year *t*.

We measure *firmsize* as the natural logarithm of the book value of total assets (wc02999) at the end of year *t*. Moreover, *leverage* is measured as the ratio of the book value of a firm's total debt (wc03255) to its total assets (wc02999). On the other hand, to compute *firmage* our main data source was the 2004 Mergent Industrial Manual which lists companies' dates of incorporation. This variable was calculated by subtracting the year in which the firm was incorporated from the appropriate year in the panel dataset. Finally, note that prior to the calculation of the variables all relevant items were deflated by using the CPI (2000 = 1). The CPI data for the U.S. were obtained from the World Bank, World Development Indicators, ESDS International, University of Manchester.

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Table 1. Summary Statistics

This table presents summary statistics for the empirical variables in the paper. *A-index* is a firm-level index of financial independence (autonomy) from shareholders which is calculated by adding one point for every year in which a given firm's cash flows are greater than its investment in specific assets, over the previous 7 years. *E-index* is the managerial entrenchment index constructed by Bebchuk et al. (2009). *Tobin's q* equals the market value of the firm at the end of year *t* divided by the book value of total assets at the end of year *t*. *CF/totalassets* is the ratio of the firm cash flows during year *t* divided by total assets at the end of year *t*. *salesgrowth* is computed as the percentage change in the firm's total sales between the end of year *t-1* and the end of year *t*. *firmsize* is the natural logarithm of the book value of the firm's total assets measured at the end of year t in USD. *leverage* is the ratio of the book value of a firm's total debt to its total assets. *firmage* is the natural logarithm of firm age which is measured in years since the company's incorporation date.

Variable	N	Mean	Median	Std. Dev.	Min	Max
A-index	8687	5.0199	6.0000	2.1651	0.0000	7.0000
E-index	8687	2.6594	3.0000	1.3638	0.0000	6.0000
Tobin's q	8646	1.5137	1.1258	1.2258	0.0360	15.8453
CF/totalassets	8685	0.1116	0.1043	0.0651	-0.3643	0.6186
salesgrowth	8686	0.0584	0.0365	0.2263	-0.9984	6.8451
firmsize	8687	21.6734	21.5809	1.4737	17.2768	27.2513
leverage	8678	0.2562	0.2581	0.1509	0.0000	0.9387
firmage	8687	4.0373	4.2195	0.6085	0.0000	5.0752

Table 2. Correlation matrix

This table presents the correlation matrix for the empirical variables in the paper. *A-index* is a firm-level index of financial independence (autonomy) from shareholders which is calculated by adding one point for every year in which a given firm's cash flows are greater than its investment in specific assets, over the previous 7 years. *E-index* is the managerial entrenchment index constructed by Bebchuk et al. (2009). *Tobin's q* equals the market value of the firm at the end of year *t* divided by the book value of total assets at the end of year *t*. *CF/totalassets* is the ratio of the firm cash flows during year *t* divided by total assets at the end of year *t*. *salesgrowth* is computed as the percentage change in the firm's total sales between the end of year *t-1* and the end of year *t*. *firmsize* is the natural logarithm of the book value of the firm's total assets measured at the end of year t in USD. *leverage* is the ratio of the book value of a firm's total debt to its total assets. *firmage* is the natural logarithm of firm age which is measured in years since the company's incorporation date. * and ** indicate a statistically significant correlation at the 1% and 5% level respectively.

Variable	*A-index*	*E-index*	*Tobin's q*	*CF/total-assets*	*salesgrowth*	*firmsize*	*leverage*	*firmage*
A-index	1.0000							
E-index	0.0503*	1.0000						
Tobin's q	-0.1113*	-0.1324*	1.0000					
CF/totalassets	0.0219**	-0.1005*	0.5803*	1.0000				
salesgrowth	-0.1222*	-0.0323*	0.1315*	0.1171*	1.0000			
firmsize	0.0855*	-0.0830*	-0.0076	-0.0353*	0.0435*	1.0000		
leverage	0.1060*	0.1127*	-0.3127*	-0.3717*	-0.0194	0.2533*	1.0000	
firmage	0.4158*	0.1533*	-0.1759*	-0.1314*	-0.0718*	0.2230*	0.2030*	1.0000

Table 3. Econometric results

This table presents the results of regressing *Tobin's q* on corporate governance and control variables. *Tobin's q* equals the market value of the firm at the end of year *t* divided by the book value of total assets at the end of year *t*. *A-index* is a firm-level index of financial independence (autonomy) from shareholders which is calculated by adding one point for every year in which a given firm's cash flows are greater than its investment in specific assets, over the previous 7 years. *E-index* is the managerial entrenchment index constructed by Bebchuk et al. (2009). *CF/totalassets* is the ratio of the firm cash flows during year *t* divided by total assets at the end of year *t*. *salesgrowth* is computed as the percentage change in the firm's total sales between the end of year *t-1* and the end of year *t*. *firmsize* is the natural logarithm of the book value of the firm's total assets measured at the end of year t in USD. *leverage* is the ratio of the book value of a firm's total debt to its total assets. *firmage* is the natural logarithm of firm age which is measured in years since the company's incorporation date. Industry dummy variables are constructed based on firms' two digit SIC industry codes. In addition, year dummy variables are included to pick up movements in stock market values that are common to all firms. * and ** indicate a statistically significant coefficient at the 1% and 5% level respectively (one tailed t-test). The table reports standard errors clustered by firm in parentheses.

Variable	*Predicted sign*	(1)	(2)	(3)	(4)
A-index	-	-0.0369**	-0.0527*		-0.0441*
		(0.0184)	(0.0142)		(0.0150)
E-index	-	-0.0857*	-0.0462**		-0.0424**
		(0.0290)	(0.0208)		(0.0212)
CF/totalassets	+		8.9612*	8.7745*	8.9026*
			(0.6800)	(0.6760)	(0.6669)
salesgrowth	+		0.2788*	0.3098*	0.2714*
			(0.0774)	(0.0830)	(0.0753)
firmsize	-		0.0134	0.0265	0.0189
			(0.0212)	(0.0223)	(0.0216)
leverage	-		-0.6934*	-0.7283*	-0.6786*
			(0.1761)	(0.1805)	(0.1737)
firmage	-			-0.1625*	-0.0938
				(0.0604)	(0.0624)
Industry dummy variables		yes	yes	yes	yes
Time dummy variables?		yes	yes	yes	yes
Adjusted R^2		0.2238	0.4530	0.4483	0.4544
Number of observations		8646	8637	8637	8637

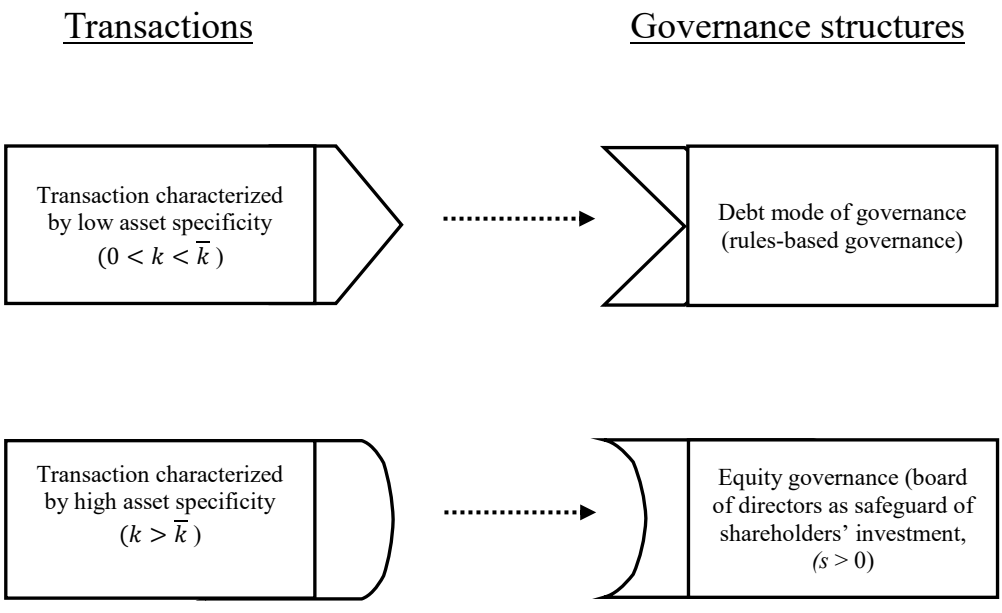

Figure 1. Efficient alignment hypothesis.

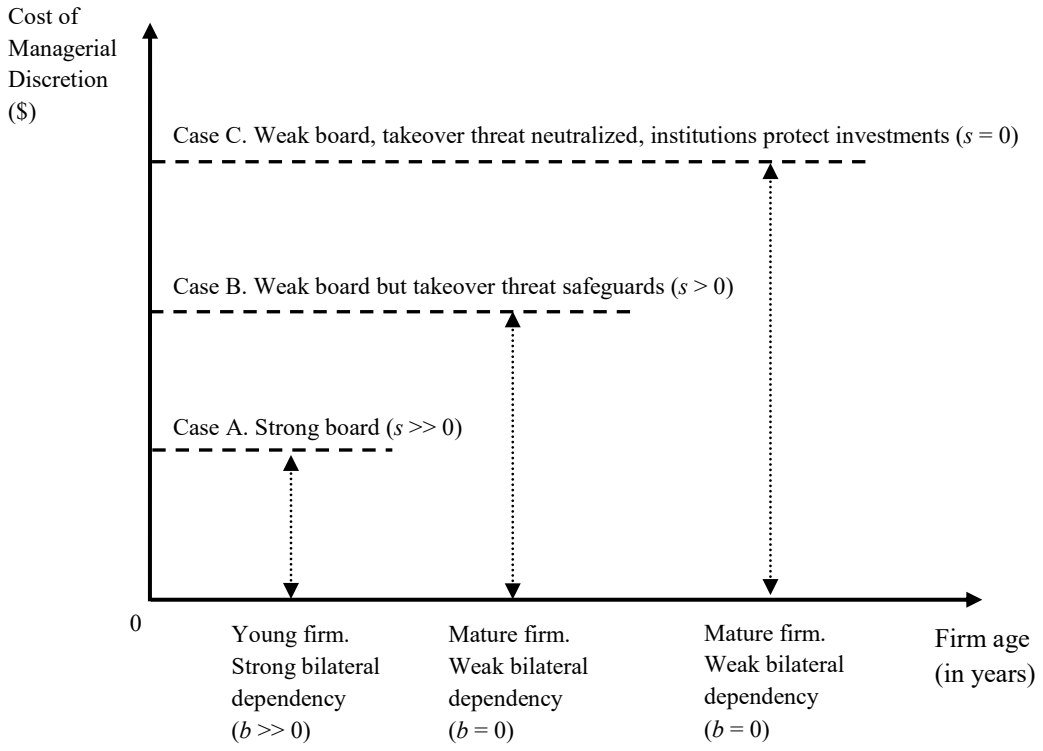

Figure 2. Evolution of the equity governance structure (transactions for which $k > \overline{k}$).

Figure 3. Firm size at the end of year *t* (log scale)

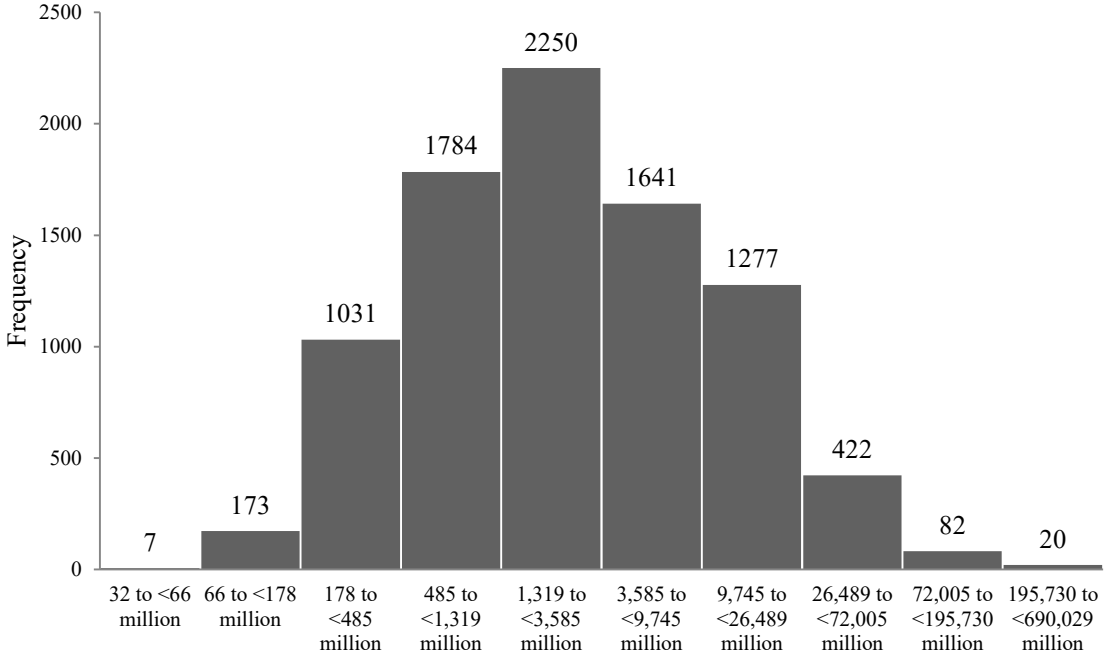

Figure 4. Firm age at the end of year *t*