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DO INVESTMENT REGULATIONS COMPROMISE PENSION FUND PERFORMANCE? EVIDENCE FROM LATIN AMERICA: A COMMENT

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Abstract

Most of the policy assertions in the paper by Srinivas and Yermo (1999), published in Revista de Análisis Económico, *are not backed by the empirical evidence. Their conclusions that "pension funds (in Chile) did not choose an efficient asset allocation or risk return combination", and that "current regulations are severely jeopardizing performance", are not backed by the evidence for Argentina, Chile and Peru. However, these assertions may be valid for the Mexican AFORE, who are banned from investing in equities and foreign securities. We dispute on theoretical grounds their proposal that "investment regulations should not be continued in the long run", by providing benevolent rationales to keep the main investment limits on a permanent basis.*

I. Introduction

Mandatory pension funds have been created by pension reform in nine Latin American countries during the 1990's (Chile (1981), Peru (1993), Argentina and Colombia (1994), Uruguay (1996), Mexico and Bolivia (1997), El Salvador (1998), and Panama (1999)). These privately managed funds compete with each other in investment performance, as this is one of the reasons that may induce workers to switch funds.

Measurement of investment performance of the new pension funds is important because achievement of market returns have been a major argument in favor of the recent pension reforms in Latin America. State-managed pension funds

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failed to yield market returns in the past, both in Latin America and around the world (World Bank, 1994, Figure 3.7). The Latin American reforms have sought to escape this problem by the creation of a "quasimarket" in pension fund management services, where private suppliers meet workers that are allowed to choose a fund manager, with the expectation that this quasimarket would achieve market rates of return. The policy relevance of testing whether this proposition holds empirically is clear.

A second important reason to study investment performance is the need to optimize the substantial number of regulations imposed on the investment process in the new Latin American pension funds. These include limits to asset allocation, regulations that prevent individual firms to be financed solely by a single pension fund, regulations that impose a benchmark on the returns of a single fund manager, requirements to make all trades in formal exchanges, and many others.

Generally speaking, there are two ways to deal with such a maze of regulations. The piecemeal approach is to study them in detail, to identify the incremental costs of each one of them and attempt a comparison with their (mostly intangible) incremental benefits. This information allows policy makers to make incremental decisions. As an example of this approach, I can report that when research by Fernando Zúñiga (1992) proved that the most costly restriction in terms of return and risk for Chilean pension funds was the one that prohibited investment outside from a list of some 20 equities, Chilean legislators moved to allow the pension funds to invest in many more equities than previously allowed, even though in a small amount each[1].

The piecemeal approach is flexible enough to propose different remedies to different countries. For example, the Mexican AFORE are banned from investing in domestic equity and in international securities, so liberalization along these two lines appears to be the obvious proposal. At the other extreme, as of late 1999 Chilean AFP have invested abroad a sizable share (14%) of the portfolio and a reform to the law has recently allowed each AFP to offer a second fund, purely invested in fixed income securities, complete with its own investment limits and relative return band. Liberalization proposals in this case require a detailed justification.

There is extensive empirical research in this line, most of it done with Chilean data, probably due to the longer time series available (Pérez Mackenna 1987, Walker 1991, Valente 1992, Walker 1993a and 1993b, Valente 1991, Tarziján 1995, Arrau and Chumacero 1998, Zurita and Jara 1999). Lately, a new literature has emerged from Argentinian data (Chisari and Dal Bó 1995, Otermin and Zablotzky 1996).

The second approach is to eliminate all (or most) regulations at once. This 'big bang' approach is usually presented as the substitution of explicit investment and related regulations by the 'prudent man rule', which is regulation by the courts, who set standards in their judgements which determine the insurance premium that directors must pay to cover their civil liability. This approach is used in Anglo-Saxon countries, who apply fiduciary law concepts and judicial review (ex-post).

However, adopting this approach is equivalent to eliminate most regulations, because in most countries pension and fiduciary law is unclear, and real life judges have proved unable to develop and apply effective standards. For example, the Goode Report (1993) in Great Britain concluded that British judges had been unable to develop standards to protect workers effectively, so a statutory framework was needed and a specialized regulator was required[2]. This may be because the matter is very technical, and resolution must be fast. In the case of Latin America, where civil courts are overloaded and inefficient, it is clear that delay would be enormous. The 'big bang- prudent man rule' approach has never been implemented in Latin America, as policy makers are understandably wary of the risks involved. The 'big bang' was the original situation in Great Britain until 1995, complete with the Maxwell scandal. This scandal prompted the formation of the Goode Committee and the subsequent reform of 1995.

However, in the second half of the 1990's a number of economists at the World Bank have proposed the big bang - prudent man rule approach (Shah, 1997). One problem that the authors in this line face is the difficulty of producing empirical evidence to support the big bang - prudent man rule story. The paper by Srinivas and Yermo (1999), henceforth SY, appears written in that spirit and tries to fill in this gap.

The SY paper makes many points that are correct. However, this comment argues that the main policy conclusions proposed by SY in the area of investment regulation are not supported by their own data, based on Argentina, Peru and Chile. This may be due to a sample selection problem, because many of their points are empirically valid for the Mexican AFORE. The second purpose of this comment is to dispute many of SY theoretical and economic arguments. To do this we argue that investment limits can be used benevolently, so they should remain in a permanent basis, and that relative return bands do not have the large costs claimed by SY.

II. Risk Adjusted Performance Before Fees

SY assert that "pension reform has not been successful in achieving high returns" (p. 103), that "passively managed funds which track market indexes would have significantly outperformed the pension funds (p. 69), and that "In Chile, pension funds realized lower returns over 1982-1997 than could have been achieved under a more liberal investment regime". We assume that SY refer to risk-adjusted gross returns, excluding commissions. We will argue that their evidence does not back these assertions.

Argentina and Peru

The evidence for Argentina is that the pension funds performed *better* than the market benchmark: the pension funds suffered substantially less risk (volatil-

ity) than the "return-matching" benchmark that yielded the same average return (see Table 7 in SY).

SY dismiss the Argentinian evidence because those pension funds value about one third of their portfolio at historical cost plus accruals, so marked to market valuations cover only 2/3 of the portfolio. However, the bias cannot be large, because the average duration of fixed income securities held by these pension funds is similar to the time period going from the adoption of historical cost valuation to the end of the sample. Moreover, a higher bound for the standard deviation of the two thirds of the portfolio that is marked to market can be obtained from the standard deviation reported by SY, as (3/2)·(5.0%) = 7.5%, which is *still much less* than the 13.5% standard deviation of the return-matching portfolio for 3 year periods. Thus, dismissal of the Argentinian evidence, which contradicts the conclusions of SY, is not warranted.

The evidence for Peruvian pension funds is that they obtained much worse returns than a combination of a local equity portfolio and local bank deposits between 1993 and 1997 (see Table 6 in SY). These facts *contradict* SY's theory because Peruvian funds are said by SY to have "one of the most liberal investment regimes in Latin America" (in p. 91, line 6). The Peruvian funds held 45% of the portfolio in equities, as of May 1998. Thus, what is espoused by SY as the best policy for the future (big bang - prudent man rule) turns out to have failed in Peru. It is surprising that this fact is not reported in SY's conclusions (p.103).

Thus, SY's strong conclusions seem to be based on the Chilean evidence alone.

Chilean results

Their Chilean evidence is also unconvincing. For the 1992-1997 period SY show that the Chilean pension funds obtained a slightly *higher* return than their "risk-matching" benchmark (see Table 5 in SY): 7.8% above inflation per year rather than 7.0% for the benchmark. We wonder whether this difference is statistically different from zero. The readers cannot know because SY do not provide a confidence interval. In any case, the assertion by SY that "*current* regulations are severely jeopardizing performance" (see p. 70) is contradicted by this evidence.

For the period 1987-1997 the Chilean pension funds obtained a return that is only slightly inferior to the risk-matching benchmark: 9.7% per year versus 11.0% per year. Again, we cannot know whether this 1.3% per year difference is statistically different from zero, as SY do not provide confidence intervals for their estimates.

When SY extend their data further into the past, they find that for the period 1982-1997 the Chilean pension funds obtained a real return of 10.2% per year, while the risk-matching benchmark obtained 11.5% per year. Again, we cannot know whether a 1.3% per year difference is statistically different from zero.

Thus, SY's strong assertions that "pension funds (in Chile) did not choose an efficient asset allocation or risk return combination" are not supported. To the contrary, the much more detailed studies by Walker (1993a and 1993b) and by Arrau and Chumacero (1998) found to the contrary. Why are these results not reported by SY?

Data biases in the Chilean case

The starting date of SY's sample for Chile biases their results against the pension funds for the longest sample (1982-1997). Their data set begins in December 1982, nineteen months after those pension funds actually began to invest (May 1981). This makes a large difference because the Chilean stock market fell very steeply between early 1981 and December 1982, due to the combination of a banking crisis and a balance of payment crisis that cut real GDP by 13.2% in 1982. A benchmark portfolio that had invested heavily in equities during the May 1981-December 1982 period would have started with a much higher standard deviation, as the IPSA index (which comprises the most heavily traded securities) fell by 46.7% in real terms from May 1981 to December 1982, and also with a much more negative return[3]. Thus, the risk-matching portfolio would have had a smaller amount of equities, and the order of returns for the 1982-97 period might have reversed in favor of the Chilean pension funds. The authors do not report how sensitive their results are to these adjustments.

The implicit proposal by SY that Chilean pension funds should have held their "balanced" portfolio, which is comprised by 60% equities, since 1982 is based only in the fact that ex-post this portfolio returned 17.4% per year over December 1982- December 1997, rather than the 10.2% obtained by the pension funds. These figures are biased by the selection of the starting date in December 1982 and do not adjust for the much higher risk[4]. We will argue below that this is a naive investment strategy that is prone to moral hazard.

Three weak links in the methodology

Three technical points deserve mention. *First*, the monthly standard deviation of actual returns is not an adequate measure of risk. When investors know that a security's price may fall 50% with a probability of 1% next month, but it turns out that the risk does not materialize over a period of 5 years, the standard deviation of actual returns is zero. But this does not mean that risk was zero over the 5 year period. SY do not mention this possibility, which is prevalent in illiquid markets such as those in Latin America. They also fail to report measures of kurtosis and other failures of the normality assumption that underlies their mean-variance theoretical framework.

Second, the annual average risk-return framework used by SY is inadequate for pension funds receiving a relatively constant inflow of contributions over a long phase of asset accumulation. In this environment, the average member is much more interested in the returns obtained in the last year of the period, which affects the value of the contributions made in each of the last 15 years, than in the return obtained in the first year, which affected only the first year's contribu-

tion. An "internal rate of return" calculation weighs more heavily the favorable investment performance over 1992-1997 than the geometric average return used by SY, which implicitly uses equal weights for each year.

Third, there is no discussion of the benchmarks used in the analysis by SY. Previous studies have shown that many benchmarks cannot be bought by a real investor of the size of pension funds, because too little of the shares of the major corporations are floating (Valck and Walker, 1995). In many companies, the larger blocks of shares are privately held and cannot be bought in small increments. Moreover, the holders of some of those blocks are families who have built their reputations around their firms and would simply refuse to sell at any reasonable price. For a pension industry that manages funds equivalent to 40% of GDP, recognition of this restriction is a sine qua non to assess performance.

The lack of reports on these technical points suggest that SY's results may not be robust and the strong conclusions may have to be softened.

III. Replacement Rate Performance

The paper also presents investment performance with a measure that may be more readily understood by members, which is the ratio between the annuity that could be purchased at retirement date and the last taxable wage.

Table 8, built with data for Chile, reports that with 40 years of contributions the actual replacement rate would be 143% of final salary, but if the risk-matching portfolio had been used, the replacement rate would have risen to 158% and if the "balanced" portfolio had been used the replacement rate would have been 268%[5].

However, the reader is not informed by Table 8 that the standard deviation of the "balanced" portfolio was 25.7% per year, which is 2,85 times the standard deviation of actual pension funds (9.0% per year). In other words, the difference between the 268% replacement rate of the balanced fund and the 143% of actual pension funds is bought at the expense of much higher risk, and thus are not comparable.

One wonders whether a reasonably risk averse and responsible society would wish to bet an old age income that amounts to an extraordinary 143% replacement rate to get a chance of improving to 268% on average, but with a big chance of falling below the 143%.

IV. Transitory Versus Permanent Regulations

When mentioning Mexican, Uruguayan and Bolivian draconian investment regulations, SY dismiss them because "they are supposed to be temporary measures". Transitory regulations seem not to be of interest for the paper by SY, as little space is devoted to these countries or to the concept[6].

However, the same concept can be applied to the original Chilean regulations, with the further benefit that they were in fact temporary, and not only supposedly so. The critical issue, not treated by SY, is when are transitory regulations justified, and when they are not. I will argue now that the Chilean regulations of 1981-89 were justified, while the current Mexican regulations are not.

As it has become more widely acknowledged after the East Asian crisis of 1997, banks can be a source of instability. Moreover, bank insolvency has implications for the regulations of other segments of the capital market.

In the 1980's Chilean law did not prohibit equity investment out of ignorance of finance theory, but by drawing on the fact that local banks were insolvent and the same was true of several major business groups (similar to chaebol) whose shares were traded in the local stock exchange. This insolvency was not public in 1980, but was well known by officials at the Superintendency of Banks, the Superintendency of Securities and the Ministry of Finance. Moreover, as the pension fund management companies were organized by the local business groups, there was a moral hazard problem: the business groups could have used pension fund money to buy each other's equities to ride the crisis, at the cost of excessive risk for members of the pension funds. Thus, banning pension funds from investing in equities was an efficient second best intervention.

When the stock market reached the bottom in 1983-85, investing in equities became a very attractive proposition. But this is an ex-post statement that should not be accepted as a basis for strong assertions. In 1983-85, it was not at all clear how would Chile extract itself from the debt crisis. Chile could have followed the Argentinian or Peruvian paths to hyperinflation (until 1990), or the Ecuadorian path (at least until 1999). The fact that stock prices in Chile remained depressed for several years after December 1982 suggests that marginal investors perceived a significant level of risk and did not expect a strong recovery of stock prices.

Considering these risks, it is remarkable that in 1985 the Chilean government allowed pension funds to invest in local equities. Of course, this was done gradually, as the opposition parties argued that the workers should not be forced to take the huge risks associated to equity investment. A further explanation is that this liberalization also furthered a separate government objective, which was to privatize the local public utilities, which were in part sold to the pension funds at modest prices. The restrictions imposed over 1985-89 on those initial equity investments may be presented as "draconian" now, with the benefit of 12 years of hindsight, but at the time were (correctly) perceived as cautious steps in a lengthy transition to a more permanent regime.

V. Investment Regulations for the Future

SY assert in their policy recommendations that "investment regulations should not be continued in the long run" (p. 101). We show now that this is incorrect for several important classes of regulation.

Overall equity limits

A solid argument for *permanent* limits on the proportion of equity held by pension funds is that they help to limit "replacement rate risk" for members. Let us remember that a major difference between defined contribution (DC) plans and defined benefit plans is that the latter guarantee an explicit replacement rate, while the former do not. Opponents of privatization towards DC plans in the U.S. have argued that DC plans expose older workers to the risk that the stock market might crash just before pensioning, reducing their pension unexpectedly and substantially, at a point in life where they have only a small opportunity to make up for the loss by working more (Aaron, 1999).

This implies that a benevolent government that has forced workers to participate in a DC plan should make sure that they reduce substantially the proportion invested in equities as they age and come close to pensioning[7]. One way to assure this outcome is to place an overall portfolio limit on the share invested in equities. One may perfect this limit by personalizing it and by making it age-dependent, but in an environment where members are offered just two or three portfolio options for other reasons, a simple limit on the share invested in equities would be (constrained) optimal.

The danger painted by Aaron also implies that any government that forces workers to participate in a DC plan faces a moral hazard problem when it grants them freedom to choose the degree of overall riskiness: if returns turn out low, the government may be forced by political pressure to bail out older workers with low pensions. Foreseeing this guarantee, workers may choose maximum risk (100% equity or even more), because if the investment is lucky they gain, while if it is unlucky, taxpayers cover the loss. To prevent this abuse, the government should limit riskiness of the asset portfolio, by imposing a permanent ceiling on equity holdings (currently 37% in Chile). Note that this argument is valid for workers of any income. Indeed, it operates more strongly for high income workers because the ceiling on the taxable wage means that they hold a smaller portion of their wealth in mandatory DC accounts, and thus are more willing to bet that wealth. High income workers can guarantee a pension for themselves through their voluntary wealth, by choosing a more conservative allocation.

Equity share regulation allows a government to limit replacement rate risk to tolerable levels and avoid moral hazard. The existence of this optimal government response shows that Aaron's assessment of the risks of DC plans are based on the unwarranted assumption that 100% of the pension fund will be invested in equities, and are vastly exaggerated.

It should also be noted that in Chile, most of the pension fund is invested in CPI-indexed fixed-income securities that are almost free of inflation risk. This implies that the conventional empirical result for the U.S. that equity investment (stochastically) dominates investment in long term nominal bonds for an investor with a long term horizon, are due only to the fact that those bonds are nominal, and are not applicable to securities markets where CPI indexed bonds have a major presence, as in Chile.

SY acknowledge in p. 76-77 a different argument for permanent asset allocation limits, which is the need to alleviate the moral hazard problem created by government guarantees on *minimum pensions* (or more generally, the first pillar of pension provision). Their story does not apply to workers with income equal to or above the average wage, because they are very unlikely to obtain a minimum pension subsidy, implying that higher income workers should be granted more portfolio freedom than low income workers.

SY fail to realize that this story does not apply to low income workers either, because the real value of the minimum pension supposedly guaranteed by the government has fluctuated enormously in the past (usually because of fiscal crises), so risks remain substantial. Thus, a low income worker that bets his DC account by directing it fully to stocks is exposing himself to a major subsistence risk, namely that the government may reduce the level of minimum pensions just when he or she depends solely of it.

SY question the minimum pension argument for permanent portfolio limits on different grounds: the constraint of one fund per fund manager "already forces fund managers to invest in similar portfolios". This response is not convincing for two reasons:

a) even though portfolios may be similar across different fund managers due to herding (see below), the average portfolio can and does drift over time. Even within a small band, each individual fund manager has the freedom to deviate slightly from the average, and the direction towards which managers find preferable to deviate matters. If the workers that pay the highest commissions prefer more risk due to moral hazard, the similarity of portfolios will not prevent excessive risk taking.
b) The constraint of one fund per fund manager may be lifted (for benevolent reasons). In fact, it was lifted in Chile in November 1999, as a new law allowed pension management companies to offer a "second fund", invested only in fixed income (mostly CPI indexed) securities. Each worker must choose between fund one and fund two. Thus, even though portfolios may be dissimilar, many workers may prefer more risk due to moral hazard.

SY are right in pointing out that equity limits have costs, such as reducing the value of investment management services to workers that are more risk tolerant than average. However, they do not propose a framework to trade off the advantages and costs of these investment limits on an efficiency basis. Instead, SY simply assert that "investment regulations should not be continued in the long run" (p. 101).

Issuer limits

The paper by SY fails to discuss another important class of investment limits, called "issuer limits". For example, Chile limits the number of equities of given company that a pension fund can hold to 7% of the equities issued by a single issuer.

The "issuer limits" are justified by the need to limit a conflict of interest between members and pension fund managers. The managers of a particular pension fund may wish to engage in the administration of industrial and service businesses. This is attractive because they can use the members' money to bet: if the industrial business does well, the managers can capture a substantial share of the surplus. If it does badly, the members are left with the losses.

For the authorities of Latin American countries, one of the few methods to prevent these bets is to disallow individual pension funds from gaining control of an industrial or service company. The 7% limit, plus a similar limit on purchases of bond issues (set at 20% in the case of Chile) do the trick. As this conflict of interest is a permanent danger, these limits should be kept permanently.

Again, SY are right in pointing out that these limits have costs, such as making it more difficult to diversify risk. However, they fail again to propose a framework to trade off the advantages and costs of these investment limits.

Profitability rules, or relative return bands

SY describe the rationale for these rules, as to protect workers from gross under performance by the fund manager each one happened to choose. I would add that this is not merely a risk for workers, but to taxpayers as well, because it would be hard to avoid public support for workers that had the bad luck of choosing an unprofessional fund manager that left them with a replacement rate that is 20 or 30 percentage points below what they would have obtained if they had chosen other managers.

The critique of SY to relative return bands is strongly worded again, as they say that these rules are "very distortionary", just because fund managers copy most of their rival's portfolio. However, the American literature on herding has shown that this may be an efficient method used by investors to detect fund managers with low ability, who reveal themselves by taking bets that fail.

SY fail to report that in the American retail equity mutual fund market, where no bands exist, retail investor ignorance has generated incentives to fund managers that are perverse, in the sense that in many cases the managers have an incentive to take too much risk, and actually take it (Chevalier and Ellison, 1997). SY also fail to report that after Peru eliminated relative return bands in 1997, due to World Bank pressure, the degree of herding remained the same as before (Valdés-Prieto and Ramírez, 1999).

The economic reasoning offered by SY is unconvincing. For example, they say that the bigger pension funds, which are subject to a wider effective band (because they influence the average return by more) "have an incentive to opt for lower risk/return options, like bank deposits and bonds". Why is this so? Big funds gain more high-commission members when they perform better than the herd. Their prediction of a distortion is also surprising because SY seem to favor wider bands, which is what bigger funds already have.

Another unsubstantiated assertion is that relative return bands "create a moral hazard problem for participants since returns no longer serve as a comparison benchmark". Why not? As long as the level of risk is similar across managers, a simple comparison of ex-post returns may allow AFP directors to identify fund managers with low ability.

After acknowledging that market forces produce some degree of herding by itself, SY narrow down their critique of relative return bands to two items:

(a) "lack of diversity in portfolio choice". However, relative return bands are compatible with as much portfolio choice as legislators choose. This has been proven by the Chilean reform of November 1999, which required each AFP to offer two funds, with each class subject to a new and separate relative return band. Thus, if legislators decide that three classes of funds provide enough diversity, they can achieve it by setting three different classes of funds with one relative return band per class; and

(b) "the elimination of incentives to achieve above-average returns". The proposed lack of incentives contradicts the observed pressure put by AFP directors on fund managers to earn above average. Each AFP's directors know that a better absolute return improves the direct return earned by the AFP shares in the pension fund, which is 1%, and also that a good relative return ex-post supplies its salespeople with another argument to attract the high salary workers, who are sensitive to relative returns and at the same time pay the highest commissions to the AFP.

Notes

1 I report this as a witness, as I was a member of the study group assembled by the Ministry of Finance (led by Mr. Eduardo Bitrán) to design the reform to the investment regime of the Chilean pension funds.

2 See chapter 4.1 in pages 184-199 and chapter 4.19 in pages 512-535.

3 The IGPA index, which includes less liquid equities, fell by 41.6% real between May 1981 and December 1982. Source: Bolsa de Comercio de Santiago.

4 A simple estimate of the bias due to the starting date: If we assume 60% of the portfolio returned -46.7% and the remaining 40% returned 15% real in the months before December 1982, the return for the period would have fallen to $100 \times [(1.174)(0.7822)^{1/15} - 1] = 15.5\%$ per year.

5 These results are obtained by assigning the returns of Table 7 (discussed in the previous section) to the hypothetical portfolios for the first 16 years of contribution, and then assigning a common return –7.5% real– to the next 24 years. Note that $(1,075)^{24} = 3.18$, so any final value difference as of year 16 is multiplied by 3.18 as of year 40.

6 SY do admit that asset allocation limits may be justified on a temporary basis, and that they can (and should) be lifted as fund managers become more experienced.

7 At the same time, the law should offer the option to maintain equity investments after pensioning in order to allow the younger pensioners to benefit from stock market recoveries. In Latin America, this opportunity is included in the programmed withdrawal option.