RECORD OF SOCIETY OF ACTUARIES
1995 VOL. 21 NO. 3A

WILL DEFINED CONTRIBUTIONS (DC) TAKE OVER?

Moderator:	ROBERT M. KATZ
Panelists:	KEN E. JAMES
	MICHAEL D. MILLS
	W. G. (BILL) OSENTON
Recorder:	ANGELA L. LI

There seems to be a trend in many countries to replace defined-benefit (DB) plans with defined-contribution (DC) plans, even in countries where DB plans have been the prevailing pattern. Are DB plans becoming a thing of the past? Panelists will debate the issues involved, the conflicts and the driving factors.

MR. ROBERT M. KATZ: We decided that many of you would be interested in getting a quick primer on what certain countries are doing in their national social security schemes. We will be hearing from Bill Osenton and Mike Mills. We're going to talk about specific countries and specific issues facing those countries in making decisions about their programs. I have one remark to give you a sense of the big picture of these issues.

If you're a plan sponsor in the private sector and you're looking at DB versus DC, you must have a couple of things in mind, such as cost. What is a suitable benefit for my work force? How is the risk transferred from plan sponsor to employees, and so on.

If you're a country, you have a slightly different set of issues. Cost, of course, is a major issue, but why is it an issue for a country? After all, a country controls whatever money it wants. Cost is an issue because of a tax base, and demographically, there aren't enough working people to support the retireds. In the private sector, you're very happy to have a job and some benefits. If you're a citizen of a country, you may believe that your government is obliged to provide you with benefits in retirement—so for a government to reduce or eliminate social security means a very drastic change in the relationship between government and its citizens, a very different one from the private sector. It's certainly a major issue in places like Europe that have long-established social security schemes based on an entitlement.

Then there's another issue. If you're a private plan sponsor and one of your employees retires and doesn't have enough money to live on, it's not your problem. However, if you're a national government and someone retires and doesn't have enough to live on, it may be your concern because you have to provide welfare or some sort of wealth transfer to avoid having citizens starving on the streets. So, the issues change quite a bit when we talk about national governments.

MR. W. G. (BILL) OSENTON: I'd like to give a broad overview of the social security systems worldwide. There has been a rapid explosion in the number of different systems. As of 1950, there were less than 50 countries with social security systems, and as of 1994, there were more than 146. This, in part, reflects the number of new countries that have appeared since 1950, but it also reflects that some countries that did not have social security systems then, have established programs now. I'll show some examples of the variability of conditions. The issues in each country seem to be unique.

A very serious problem in many countries is lack of coverage for members of their population. Inadequate benefit levels, of course, is a problem in many countries, particularly in developing countries or countries with new systems. Inadequate sources of finance is a universal problem especially in countries with new social security schemes. Most of these are developing countries and in these situations, diverting sufficient money to provide a reasonable social security system is very difficult. On the other hand, the countries that have had social security systems for 40 or 50 years or more are finding that the systems are more expensive to maintain than the governments had hoped, and while each country had a rapidly expanding economy, some economies are now contracting or slowing, and financing is a real problem. I think that applies to both Canada and the U.S. Another issue that arises in some countries, particularly those with more mature systems, is the level of benefit fraud.

I think the major design problem with many of the developing countries is that plans are generally limited to the formal sector of the economy which may be as small as 10% of the working population. When you get into cottage industries and very small operations, it gets very difficult to provide coverage. If you have a plan that only covers the formal sector, it's not going to be much good in terms of covering the population as a whole.

The countries also have current circumstances that vary greatly. There are developed and underdeveloped countries and countries with growing, declining or mixed economies. There are those with a prosperous capitalist economy and those with a socialist economy. These are all issues that come into the social security equation. Then there is the current state of the national pension system. It may be mature or new. It may be inadequate or nonexistent. There is very little correlation, as you'll see from the examples, among the issues of maturity and how developed the economy is or how the economy is running.

CHINA

China is a large country undergoing major change. In the past, it didn't need much of a social security system because the majority of the population was employed by a state enterprise, and benefits and pensions and other forms of protection were delivered through the state enterprise. Now the country is rapidly turning to a privatized economy and it needs to replace the state functions. China has been experiencing very rapid growth, but it has been uneven. Some of the provinces in southern China have made tremendous economic strides, while some of the northern provinces have made hardly any at all. So, the effect of the changing economy is to produce prosperity in some parts of the country and very little in others. China also has an aging population which seems to be a common problem. When they say China is an aging country, they mean it's moving from a very young country to something with a more reasonable age distribution as opposed to some country like Japan that's moving from having a reasonable age distribution to one that will have a very high proportion of older people within the next 30 years.

BULGARIA

Bulgaria is a former socialist economy and unlike some of the other socialist economies, it's not making a very rapid transition toward privatization in a capitalist economy. There isn't the private economy yet to support a change to the social security system. It also has special problems in terms of employment and trade. Unemployment is at 20% and the trade is badly affected by outside factors including the war in Yugoslavia and the collapse of trade with the former Soviet Union. It was also badly affected by the Gulf War. It's definitely a country in transition and in crisis, and that's a very poor basis on which to establish a revised social security system.

THAILAND

Thailand has real coverage problems. It had a variety of systems existing for some time, but only about one-third of the workers are in the formal sector and only about one-half of those workers in the formal sector are covered, even though employers with ten or more employees have coverage. Obviously, it has many very small units in the economic system.

GAZA STRIP AND WEST BANK OF JORDAN

The Gaza Strip and the West Bank of Jordan is being dominated by Israel, and their special problem is that they're highly dependent on employment elsewhere. At their peak, they had 35% of their workers employed in Israel and 10–15% were in the Persian Gulf States. Up to 25% of their national income comes from these sources. During the Gulf War, many of those people were sent home. It's obviously a very highly unreliable source of income, and of course, it would be very difficult to collect taxes for social security on income earned overseas. So, their special problems are their lack of coverage and their highly dependent economy.

URUGUAY

Uruguay has a long tradition as a welfare state. It had a very wealthy economy at the beginning of the century based on cattle and meat products. At that time, it established a social security system that was, quite generous by South American terms, but its economy has been less able to compete since the 1930s, and so Uruguay now finds itself in a difficult situation. It has had to make various piecemeal changes and now has a fragmented system that it is looking at revising. Almost every one of these countries has social security reform on the agenda, except that the reform that needs to take place is very different in each country.

UNITED KINGDOM

The United Kingdom is a country with a well-established social security system that was instituted soon after the war by the Labour government and it replaced many private schemes. About two years ago, they conducted a major campaign to look at benefit fraud in social security and prosecuted 270,000 cases.

CANADA

Our big concern at the moment in Canada is that we may see the contribution rate to the Canada Pension Plan (CPP) rising to a high level in another 30 years, based on the current projections.

Before Mike talks about the countries that have DC plans, I want to make a couple of general comments on devising plan structure. The problem with the plans is that they're reflective of the economy. Therefore, correcting the plan does not necessarily correct the problem. For example, in Canada, some people think that the way to solve CPP's financing problems is to provide less generous benefits. But there will be a time when you will have many retired people who need basic sustenance that has to be provided by the active part of the economy. The CPP is only part of the delivery system. Amending the CPP will not make the problem go away. If you want to find an acceptable solution to people retiring into poverty, you won't solve the problem by taking private and public plans away.

I don't have much faith in DC plans at any level, particularly at the national level. I think DC dodges the issue of design. I've seen this in the private sector. Companies put in a DC plan, and don't worry about not doing a good job because they never have to look at it. If they had a DB plan that wasn't doing a good job, they would be very worried about it—the cost of increasing it, and so on—but when you have a DC plan, it seems the idea is you just put it in and forget about it. From what we've seen in the private sector, a DC plan can produce too much or too little for different people and this dilemma must be even worse for a national plan.

The other thing is that a DC plan isn't going to solve the problems with social security plans worldwide. A DC plan is entirely based on the money put in. If a DC plan covers only the formal sector, it probably requires a minimum infrastructure, maybe better than a national DB plan would require. So, I doubt if it can work on a grand scale.

MR. MICHAEL D. MILLS: I'd like to paint a picture of some countries that have elected to use DC for their social security system. I'm going to restrict it just to the pension or retirement benefit.

Africa, Asia, the Pacific Ocean region, and South and Central America use DC. Basically, the four areas have very different DC designs. It is surprising how many countries have DC benefits. There are over 20. Asian countries that offer DC, unlike what Bill said, are not newly emerging countries. India is not a newly emerging country. They've had a long-established social security system based on DC. Table 1 shows when legislation was introduced that made the last change.

ASIA

Some of the countries have had legislation much longer, such as India. A common factor with the Asian countries, like Singapore, is that they work with a national provident fund (Table 1). That's the only unifying theme. You can see contribution rates as low as 2.2% and as high as 20%. The Singapore contribution rate goes to 20% next year. The other thing that varies quite dramatically is whether or not it's taxable or tax-free. If you look at coverage, and Bill alluded to the problems of coverage, you'll see that it's not universal in each country. Everybody is not covered by it. Employees earning less than 5,000 rupees a month in India are not covered, and 5,000 rupees is close to the average wage, so a lot of people are not covered. An exemption in many countries is that people who work in domestic employment are not covered. In some countries, that's a large portion of the population.

AFRICA

Africa has had DC arrangements for quite some time (see Table 2). Kenya introduced it in 1965; Tanzania introduced it in 1964 after gaining independence from the British. When

TABLE 1
ASIA

	India	Indonesia	Malaysia	Nepal	Singapore	Sri Lanka
Contribution Employee Employer	 10% 10%	 2% 3.7%	 10% 12%	 10% 10%	 20% 20%	 8% 12%
Retirement Age	60	55	55	*None specified*	60	55m 50f
Early Retirement	55	?	50	?	55	?
Benefit	Lump sum	Lump sum	Lump sum/ Installments partial WDLs	Lump sum/ Partial WDLs	Lump sum and annuity or monthly WDLs	Lump sum
Tax	Tax free	Tax free	Tax free	?	Taxable	Taxable, max 15%
Legislation Date	September 1994	July 1993	November 1994	1991	1991, changes July 1995	1958
Coverage	employed earning 5,000 rupees/ month (Rp 5,000 = $159)	Employed 10+	Employed/ Voluntary for self employed and domestics	Government employees/ Voluntary for employers with 10+	Employed and earning S$50/week (S$50 = $34)	Employed
Exclusion	Miners/ Railways/ Public Employees/ contracted out	Public Employees/ Military	Teachers/ Armed Forces		Some self employed/ Public employees/ Employees under approved pension plan	Family labor/ Employees under approved PPF/ Public employees/ Local government

TABLE 2
AFRICA

	Gambia	Kenya	Nigeria	Swaziland	Tanzania	Uganda	Zambia
Contribution Employee Employer	 5% 10%	5% 5% Max. Ksh 80/month (Ksh 80 = $2)	2.5% 5.0% Max EE N 1,200/month (N 1,200 = $55)	 5% 5%	 10% 10%	 5% 10%	 5% 5%
Retirement Age	55	55	60	50	55	55	55
Early Retirement	45 if unemployed	50	?	45	any age	50	50
Benefit	Lump sum	Lump sum	Retirement grant and pension	Lump sum/ Installments/ Annuity	Lump sum	Lump sum	Lump sum/ Installments/ Annuity
Tax	?	Tax free up to limit (approx. $8,000)	Lump sum tax free with 5 years membership pensions taxable	?	?	?	?
Legislation Date	1985	1965	July 1, 1994	1974	1964	1985	1973
Coverage	Employed in private sector	Employed	Employed by Companies with 10+	Employed	Employed	Employed by Companies with 5+	Employed
Exclusion	Public employees and those with private lands	Casual workers/ Public employees	Casual workers/ Aliens/ Self Employed/ Public employees	Casual/ Domestics/ Aliens/ Public employees	Domestics	Temporaries/ Public employees	Casual/ Self employed/ Co-ops/ Public employees

Africa had the wind of change blowing through it, something happened. You might think that this is an example of how to start a DC program because it has been running for so long, but look at some of the limits. The maximum contribution in Kenya is $2 U.S. and in Nigeria is $55. There are very small pockets of money building up for basically very poor people. They have such a low maximum in Kenya because $2 is considered to be a large part of somebody's earnings. We're talking about a country that has developed a DC program on very little money. All of these countries are considering scrapping their DC arrangements. As Bill alluded earlier, it isn't working and they're talking about replacing it with DB arrangements.

SOUTH AMERICA

Probably the most interesting example at the moment is South America (see Table 3). You may be familiar with the concept that was developed in Chile. In 1981, they introduced legislation that took a completely different approach to social security. There are no contributions from the employer—they are entirely made by employees. The Chilean social security system is based on the accumulation of individual wealth or capitalization. Chilean employees put 13% into a fund that is managed by Administradoras de Fondos Pensiones (AFP). They put their money in AFP and these firms compete with each other. You can move your money from one fund to another, but it's your money. There are many disadvantages of the Chilean system because you have no control over asset mix, other than the choice of fund. You choose a particular fund, and you have only one account. So, if your fund does badly, then you have to move it to another fund and everybody moves in a herd. The result has been that the investment performance has been very bad or uniformly mediocre. Oftentimes these AFPs go broke. But since Chile started it, Argentina, Columbia, and Peru have all introduced essentially the same thing. They have a DC system running, but there's a floor that's guaranteed by the government. If you come to retirement age, your money won't buy enough pension, the government chips in with a guarantee. So, the system is in transition from DB to DC and it is not mature. Chile's the oldest, but still immature. The Chilean government specifies the range of the rate of return that can be offered on these funds, and anybody who achieves a rate of return above a maximum level has to put the excess money into a profit account, and in years when the fund achieves below the minimum level that's acceptable, they can draw down on that account. This system works as long as there are some good years and there's money in the profit account. When funds get below the minimum without money in the profit account, they go bankrupt and the government shuts them down and the money moves on to the next money manager.

Mexico is unique because it still has a DB social security system, but is has introduced a very small 2% contribution rate on top of it which is required of all employers. It's not a DC arrangement—it's a top-up arrangement.

PACIFIC OCEAN

All of the Pacific Ocean countries are very small. They started their social security systems a long time ago, but look at the coverage level (Table 4). You're covered if you earn more than $7 per month. You start work at age 14, so that's why you can retire at 55. These are very small plans in very small countries with very small funds and they exempt many people. In Kiribati, they exempt the domestics, who constitute about 25% of the working people, which supports Bill's comment that coverage is one of the big issues.

TABLE 3
SOUTH AMERICA

	Argentina[1]	Chile	Colombia[1]	Mexico[2]	Peru[1]
Contribution Employee Employer Government	 11% 16% Max. Sal. $3,780/month	 13% (max $220) Nil Subsidy for min. benefits	 2.875–3.375 (96) 8.625–10.125 (96)	 Vol. 2%	 10% Vol.
Retirement Age	65m 60f	65m 60f	62m 60f	65	65
Early Retirement	None	Some subject to min. benefit	62m 57f	60	Any time (min. benefit)
Benefit	Annuity with min. benefits	Annuity with min. benefits	Annuity with min. benefits	Lump sum/ Annuity	Annuity with min. benefit guaranteed
Tax	Non taxable	Taxable	Tax free (until 1998)	Tax free (to a max)	Taxable
Legislation Date	July 1994	1981	April 1994	1992	1991
Coverage	Employed and self employed (VOL)	Employed and self employed (VOL)	Employed (VOL)	Employed	Employed (VOL)

[1]These countries are currently converting to DC. During a transition period, there will be both DB and DC.
[2]Mexico has a base DB system.

TABLE 4
PACIFIC OCEAN

	Fiji	Kiribati	Papua/New Guinea	Solomon Islands	Vanuatu	Western Samoa
Contribution Employee Employer	 7% 7%	 5% 5%	 5% (up to 10% opt.) 7%	 5% 7.5%	 3% 3%	 5% 5%
Retirement Age	55	50	55	50	55	55
Early Retirement	Females upon marriage	45	After 15 years contribution	40	?	?
Benefit	Lump sum (partial annuity with joint life option)	Lump sum (interest at 9%)	Lump sum	Lump sum	Lump sum (interest at 4%)	Annuity (actuarial equivalent) or 75% annuity and lump sum
Tax	?	?	?	?	?	?
Legislation Date	1985	1976	1980	1976	1987	1972
Coverage	Employed	Employed earning $7/month	Employed 25+	Employed age 14 and earning $6/month	Employed age 14 earning $26/month	Employed
Exclusion	Public employees/ Military/Police/ Those with equivalent benefits	Domestics	Workers in certain critical crops/Public employees	Public employees/ Self employed (OPT)	Those with approved plans	

I want to raise some issues by looking at these DC programs. The first one is contribution rates. Should they vary by age? Only one country at the moment does that—Singapore. Older people contribute less. But the South American countries that have a DC program are now considering whether they should have a contribution rate that varies by age. The rationale they're using is that people go through peak earning cycles, and in your mid-30s and 40s, you're probably maximizing on your earnings. They are thinking of increasing the contribution rate, and then reducing it for younger people and for older people. Some countries allow annuities; some require annuities; some only allow lump sums; some allow you to take installments. The big issue is, how should you annuitize these lump sums? And then what role does the government play in that annuitization? Some countries insist that you annuitize through the fund. Some allow you to go and buy annuities. Some don't have a market to buy annuities in. There is no strongly established annuity market in the Pacific Ocean. Australian companies try to sell business there, but they're still not well entrenched.

Investments are a big issue and the role of the government comes into it. Should they be public investments? Should they be private? Chile's opted for private, but there's still a lot of investment in government issues. Other countries have used the provident funds for political purposes so the rates of return on the provident funds have been very low. A good example would be Singapore where much of the fund has been used to build houses and to develop the infrastructure of the city. What should the role of government be? Should they allow these type of funds? Should they not allow them? Should they create them or not ? What guarantee should they provide? Again, in Chile, the government plays an extremely active role in supervising the investment to the extent that there's still a very pervasive influence by government.

Inflation is the big problem everywhere. What do you do about inflation? How do you cope with these plans during a period of disinflation, if that happens? Negative rates of return don't help citizens develop strong retirement plans. And the other thing that's being argued in some countries is, if the country forces annuitization, should it be indexed or not? And then, what's left out in this presentation is other benefits. Virtually all of these plans have other benefits associated with them. For example, in Chile, where you put in 13%, 3% goes to buy insurance. It buys your long-term disability and life insurance for survivors. So, only 10% is being accumulated for retirement. It illustrates that in a social security system, one cannot focus only on the retirement issue. Even in small countries like Kiribati and the Fiji Islands, part of the contribution is used to provide spousal benefits. Interestingly, none of the Pacific Ocean countries that I could find had a disability benefit.

MR. DONALD A. MCISAAC: I work with the World Bank and we published a report last year called "Averting the Old Age Crisis," which might have served as a reference for this presentation because it looked at the problem in many countries around the world. If this presentation had been focused on whether it is time to get away from DB social security systems, it would have been quite a different presentation because what we find in most countries is a broken down system of pay-as-you-go social security and we are challenged to find a way to match up people's benefits to what they were expecting through their lifetime. There was reference to Eastern Europe. Here you have a situation where people have been accustomed to a lifestyle where everyone's expected to be looked after as they reach old age. Nowadays, the realization of the so-called market economy is that people do not receive adequate income to support them in their retirement years and the government doesn't have the means to provide that adequate income. There are the old people who, throughout the years of the Soviet era, expected the elderly to be looked after, but pay-as-you-go systems cannot function. So, what is the model that you're supposed to use? The World Bank's paper, which was written by economists and not by actuaries, recommended that the solution is a combination of things. It is not entirely DC or entirely DB. It is certainly not pay-as-you-go, but some combination of these things can be recommended. The one model that was advocated was a system that is fundamentally DC for the majority of the work force but with a floor that ensures that everyone receives a minimum level of income. This way you can meet both the needs of your minimum wage earner and also provide a reasonable level of savings for retirement for your medium wage earner. These are very serious problems, as the panelists indicated.

One of the reasons that my colleagues at the World Bank have been in favor of the DC approach is because you can at least link contributions and benefits together which does not happen under a conventional pay-as-you-go system. In addition, what happens in the type of systems that were described here is that you create opportunities for evasion. It's not uncommon for people in a system that is not a true DC system to find ways to understate income so as to minimize the rate of contribution because they know they're going to receive a benefit that's unlinked to their contributions at the end of time. So, for these and other reasons, we have been advocating building a security system around DC. I do not agree with the statement that was made that the Chilean system has not been a success. It has been a success from an economist's point of view because of what it has done to the rate of savings in that country—both in terms of generation of capital markets and also the overall savings rate. It's something we could benefit from in our part of the world. In addition, if you talk to anybody who lives in Chile, every single person knows exactly how much money he or she has accumulated in his or her account because everyone can go to the bank and look it up on a computer screen. The problems with the system are numerous, but it certainly is a success story in my estimation.

Finally, I'd like to add that in Canada, we already have a multipillar system. The registered retirement savings plans (RRSPs) are an individual form of savings which is an incredibly successful program. It must be a problem for the government in terms of the tax deferral that it results in, but everybody, even young people, put the maximum amount they can into their RRSP every year because they realize what that means in terms of long-term savings. So, I think individual DCs are an important part of retirement security.

MR. KATZ: The whole idea in a DC plan is that I know how much money I have in it, but how much retirement income is that going to provide? I think that's a critical issue. Don also made passing reference to capital markets. Argentina followed some time after Chile in establishing capital markets, but one of their principal motivations was to stimulate capital markets within Argentina. If you look at the basis on which Argentina's system started, it was as much to spur capital market investment as it is to provide benefits for people. So, I think that's an important element as well. I think one of the concerns in the DC area is that countries like to use good investment projections to show you what you're going to get. Those of us who have worked in the more traditional field of employee communications, like to say on our benefit statements—if you earn this much money for the rest of your life, you're going to have billions of dollars to retire on—but it doesn't mean anything because of inflation, and because investments don't turn out as well as hoped. So, I think that's another problem with Chile. If we were going to debate whether it's a success or not, I think some of the projections that the Chilean government used were a little bit optimistic.

FROM THE FLOOR: I live in Tokyo and I want to point out a personal observation that's true both for countries and for individuals; also it is being driven home by the problems in northern Europe and the former communist countries. The best thing to have in retirement is wealth, and the best thing to do is to create wealth prior to that time. The problems we're seeing in eastern and northern Europe have nothing to do with the systems that are trying to provide retirement security but with the fact that wealth has not been created in line with the needs of society to provide retirement at the point where people have to stop working. I think that a mandatory individual savings program—similar to Canada's in which a person is significantly encouraged to save his own money and has some control over it as opposed to investing in the government's promise to pay in the future where the capital markets are being encouraged as opposed to additional government spending—creates the mirage of individual equity. I think that any truly governmental program has, as its primary purpose, to provide security after employment and that has to be achieved through whatever sources are available. When you create a mirage of individual equity, then people start to complain because their benefit isn't fair. My parents are getting much more relative to what they contributed to social security than I can ever hope for, but that's not the purpose of a social program.

MR. JOSHUA DAVID BANK: I want to make a couple comments about South America. I was in Chile last year. Bob questioned whether the new system is better. Two Chilean men sat next to me and one of them pulled out his statement from the DC plan and starting saying to me, "This is wonderful. Look at all this money I have accumulated." The returns for the last 13 years had been phenomenal and the man to the left of me said, "I didn't trust the government when they gave me the chance to opt for the new plan." So, the difference was something like 3-1 in monthly income when these people reached retirement. The man in the DC plan happened to live in times when the economy was booming; the other wanted to stay under the old system and didn't trust the new one and ended up losing.

I want to get into the reason for choosing alternative methods other than DB. Retirement security has never been at the top of the list. When I was in Argentina, I spoke to some of the partners in our firm and they were incredulous that they had an unlimited "401(k)" limit. They could put as much of their earnings as they wanted aside into these retirement funds and get a tax deduction. They know that's probably a very short-term loophole, but the reason for setting up those funds was to build some capital and that may indirectly help the overall economic situation. I haven't heard much emphasis on the reason for going DC being very similar in the private and government installations which is to reduce your obligation. Many of my clients want to get out of DB because they don't want to be saddled with this permanent commitment. Even though, ideally, you're not getting out of that commitment by going DC because supposedly the government has to pick up the tab anyway. I would theorize that in 90% of these countries the government doesn't pick up the tab. If you starve, you starve. U.S., Canada, and the industrialized world will come to your assistance and give you a basic subsistence type of living, but in countries where people are starving before retirement, the people are going to starve after retirement as well.

MR. KEN E. JAMES: I'd like to make a few observations on the comparisons of the different countries. In the world of a global economy that we all seem to be thinking, feeling and talking about these days, it is very difficult to imagine that we can operate efficiently in a global economy without fully understanding all the ramifications of the different social systems within which we are working. In that context, it was very dramatic to see the range of contributions for these systems that our panelists talked about. For example, Singapore has a 40% DC plan—with 20% coming from both the employer and employee. It's hard to imagine, with many of the problems that countries are dealing with, a system that, so far, has been able to support a 40% contribution system. Yet employees' contributions range from less than 2% for some countries to 20% for others, and total contributions range from less than 5% in some countries to 40% in others. So, the challenge before us is how do we operate on a worldwide basis with all these different systems? If you can imagine that you had companies within Canada or the U.S. that had that big a difference in strategy of retirement design, how would they compete with each other? How will these countries compete with each other?

Another thing is that a majority of these plans have age 55 as the primary retirement age, which seems low, especially at a time when age 65 in Canada and the U.S. seems too low. Can we afford to expect that once you reach age 55 (or 65), somehow a special system or your accumulated personal wealth is going to take care of you for the rest of your life without some additional focus after this age by either you or by your employer or by the government?

MR. KEVIN P. TIGHE: One thing I read about the Chilean model after it had been in place for a couple years was that all the individuals ended up owning a huge chunk of the gross domestic product (GDP). With the amount of assets accumulated and projected to accumulate, projections show that all these individuals may eventually own up to 50% of the GDP, and they're starting to favor private solutions over government solutions to various problems encountered by society. One thing to consider when the government is going for a DC rather than a DB approach is that the citizens are suddenly going to be owning or be part owners in the economy and in all the different companies out there.

MR. BANK: We've heard of CPP and the Quebec pension plan (QPP). What about a world pension plan or WPP? Do you see that ever happening? There would be a very base, low level of security, but it indirectly happens already where countries start going bad and the World Bank or all the world financing agencies come to their rescue anyway.

MR. MCISAAC: There has been an attempt made in some of the African countries. I think you have to appreciate that there is often a cost of any kind of administration that you put together. The idea was to create a cross-national pension scheme or social security system that we could administer out of one office and that would apply to many countries. As you might expect, what hasn't come to fruition yet are the political problems that prevent countries from doing things together in any field. While it might be a vision to come, I think there's a great deal to do before we could achieve something like that. If we could have a world where we could find a way to raise the standard of living to some uniform level in all countries, we would achieve a marvelous thing.

MR. KATZ: Let me add a comment on that and take a look at the situation in Europe which supposedly is uniting and at the problems they're facing with relatively comparable economies and standards of living. Yet from one country to another, they're vastly different. If you take a look at the levels of funding, or lack thereof, I doubt if Switzerland or Germany would throw in their lot with Italy or Spain. The reason is that some of those governments have promised benefits far beyond their capacity to ever tax or pay; however, others have taken a sounder approach. I participated in a conference on retirement in Spain last year and a very strong segment of the population believes that it is the government's obligation to pay retirement benefits regardless of the government's financial ability to do so. There were a number of people who asked, "How are you going to pay the benefits if you can't tax and you don't have the money?" The response was, "We don't care; that's not our problem; we want a retirement benefit." I don't know how we deal with that. It'll be very interesting to see if our profession can make sense out of a situation in which a benefit has been promised, but there's no money to pay it. If we treated our clients like that, we'd all be fired, but it's a very real issue. To go back to Josh's comment on a world pension plan, I think the most likely opportunity would be in countries with similar circumstances and Europe would be the best of all the continents. I can't imagine it there, so I'd find it very hard to believe it would happen elsewhere.

MR. C. DAVID GUSTAFSON: Two comments on the Chilean situation which probably are worth repeating. One is, it's not a perfect system. It does have relatively high administrative costs because members get to change their investing medium fairly frequently, and they're encouraged to do so. There are marketing costs with that system which might be minimized in a better design. The other is that there are government guarantees of these investment funds in the event that they do not obtain the investment yields that they're supposed to, and the government will have to take over at some point in time. I had a question of a broader nature. When you're dealing with these countries and you're trying to do your actuarial function, what types of models are you using? What types of input comes from economists? What are the time horizons? What macroeconomic factors are you using to advise countries or clients who are looking at these types of decisions? These are certainly long-term issues in all these countries.

MR. MCISAAC: Those are very important questions. We did some forecasting in Thailand, and I was surprised by how much we were relying on economic projections which both the staff, my colleagues, and the local people had deemed to be reliable. However, when you're talking about social security, you are forecasting. We were forecasting to 2075, and we actuaries speak of the expanding funnel of doubt. By the time you get out to 2075, any assumptions you want to select today become basically meaningless. We were using our best guess. However, beyond five or six years, I suppose our assumptions aren't worth the paper they're printed on.

MR. JAMES: One observation is related to Dave's point in the context of our modeling with corporations. I would expect more modeling should be done with corporate clients today than in fact is being done. Our clients agree in concept that we are dealing with long-term issues; however, decisions are made with a relatively short-term horizon in mind. Employers want to make changes from DB plans to DC plans and transition as quickly as possible. There are more long-term ramifications than employers want to hear, which makes the job more difficult for the consultant. But, we have a responsibility to demonstrate these ramifications. Otherwise, employers and employees may have inaccurate long-term perceptions about future outcomes.

MR. JAMES JOHN PANZA: You touched on an important factor which is the age expectations of receiving pension benefits. I think even the poorest countries could afford a wonderful retirement program if the population retired at age 150 or 200 and that's probably where all of the world is going to go in order to support the promises that have been made. With that in mind, I'd like your opinion as to whether a DB or DC type of plan would be better to politically address those concerns. DC has contributions being made year in and year out and has continued earnings, which gives some reason why a person would want to defer receiving benefits. In contrast, in DB plans where the same benefit would just be postponed later and later in life.

MR. OSENTON: That's one aspect in which DC could work much better because it's self-adjusting. If you reach 64, and you can't afford to retire, you just wait another year. It works if a person has the option to continue working, but when you have a person who doesn't have the option to continue working, the problem with the DC plan is it forces people out of the economy at age 57, for example. Anybody who has done any calculating knows what a terribly low benefit a money-purchase contribution can produce if you retire early. So maybe it won't be doing its job.

MR. STEPHEN ANTHONY WHITE: As part of the projection for a DC system, what happens when you have a country that accumulates a massive amount of DC investment over time and the capital markets are unable to absorb it all and the rate of return on those funds over time go down quite a bit? In particular, as retirees start retiring and selling off those assets, is the market going to fall in upon itself?

MR. OSENTON: My view is that you can't have a highly funded national plan unless there is somewhere to invest the money. It's not practical to prefund the national scheme. The question is where is the money going to come from when a person is in retirement. If an individual is wealthier than the rest of the population, then he or she is fine. But if everybody is nominally wealthy and there is a small working population, then who is going to produce the goods and services? If you have a high ratio of retired persons to active persons, that means there would have to be a significant drain on the productive capacity of the people producing goods in order to provide a standard of living for those retired people. This is why I said that something like the CPP is only a delivery mechanism. If you go from a ratio of 6:1 or 7:1 from active to retired, and you go down to 3:1, that means that the standard of living for one retired person, in real practical terms has to be drawn out of three actively employed members.

If you have a financing scheme, it doesn't help you because the money has to come from somewhere. It may not if it's an unfunded pay-as-you-go scheme. The way in which that delivery is going to be done is by taxing three people and paying a social security benefit to the one person, but if you are trying to do it in an entirely financed economy, then the person who is sitting there with an investment that they are going to use for their retirement income must either have somebody pay him interest or must have somebody redeem their capital. Either way, the active person is going to have to take a fair bit of their nominal income and pour it into either investing, by buying the investments that the retired people are going to sell, or paying interest on the bonds that the retired people own. It doesn't make much difference unless you can go outside the country.

What's the solution? One solution is for us to invest a good proportion of that plan offshore. Unfortunately, that won't work because all the places we think of investing in have rapidly aging populations, too. Japan, the U.S., the U.K., and Europe have the same problem. It could be a real problem for a DC plan. I think that the national pension plan is only reflective of the actual situation. If we do get to a high ratio of retireds to actives, there's going to be a heavy drain on the productive capacity of both actives towards the retireds by some mechanism or other, or else we're going to have to let them have a poor standard of living.