Individaul Accounts for Social Security Reform

Turner, John A.

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Introduction to Individual Accounts

TYPES OF DEFINED CONTRIBUTION PLANS

This book starts out with some basics. The first two sections of this chapter consider different types of defined contribution plans and take a broader perspective than most of the remainder of the book. Although the focus of the book narrows in subsequent chapters, the following types of defined contribution plans are discussed in this book.

Voluntary Defined Contribution Plans

These exist in Ireland, Canada, and the United States and are prevalent in about a dozen other countries. Employers provide the plans voluntarily in order to attract the caliber of employee they wish to hire.

Mandatory Individual Accounts

Argentina, Chile, Peru, Mexico, Poland, Sweden, and Hong Kong have these plans (Gillion et al. 2000). The large majority of countries around the world, however, provide social security old-age benefits through a mandatory defined benefit system, based on principles of social insurance. Most high-income countries have such programs, but an increasing number of countries provide social security benefits through mandatory defined contribution programs.

Mandatory Employer-Provided Defined Contribution Plans

These are found in Switzerland, Australia, and Denmark (Rein and Turner 2001). Such plans have become the foundation for a mandatory system in some of the high-income countries of the OECD, where widespread employer-sponsored pensions have existed for many years on a voluntary basis. These mandated plans can be either defined benefit or defined contribution; in Switzerland, a hybrid combining both defined
benefit and defined contribution features is commonly used (Turner and Rajnes 2003).

**Widespread Collective Bargaining**

Sweden, Denmark, and the Netherlands have quasi mandating of employer-provided plans, but this is not a statutory requirement. Rather, it derives from a legal framework that supports collective bargaining and from the resulting contractual agreements between labor unions and employers that cover most workers in the country.

**Voluntary Carve-Out Individual Accounts (VCOs)**

In the United Kingdom, these plans allow workers to voluntarily substitute an alternative for part of social security. Called “contracting out” in the United Kingdom, this type refers to a system where workers or firms, depending on the arrangements, can voluntarily withdraw from part of social security if they provide a replacement pension plan at least as generous. (See Box 2.1, Voluntary Carve-Out Accounts around the World.)

**Provident Funds**

A number of former British colonies, such as Singapore, have these government-managed individual accounts. Provident funds are national mandatory savings plans that generally pay benefits in a single payment, a lump sum benefit. While other types of social security programs offer survivors and disability benefits and provide benefits as an annuity, provident funds usually only provide a lump sum retirement benefit. Malaysia and Indonesia have large provident funds. A number of countries in Africa and the Caribbean have terminated their provident fund plans in favor of traditional defined benefit plans that provide social insurance.

The contribution rate in different types of plans varies considerably based on the role of the plan for the retirement income system. Table 2.1 shows the contribution rate for some individual account plans in different countries. While contribution rates for traditional defined benefit social security programs have risen in a number of countries, the rates for mandatory individual account plans have been stable.
The preceding section described types of defined contribution plans but did not present a structure for how they relate to each other. This section highlights important differences among types of defined contri-
Table 2.1 Contribution Rates in Individual Account Plans in Selected Countries, 2005

<table>
<thead>
<tr>
<th>Type of plan</th>
<th>Country</th>
<th>Name of plan</th>
<th>Contribution rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandatory, funded</td>
<td>Australia</td>
<td>Superannuation Guarantee charge</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td>Chile</td>
<td>Administradoras de Fondos de Pensiones</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>Denmark</td>
<td>ATP</td>
<td>Flat amount</td>
</tr>
<tr>
<td></td>
<td>Mexico</td>
<td>Administradoras de Fondos de Retiro</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>Sweden</td>
<td>Premium Pension</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Switzerland</td>
<td>BVG/LPP</td>
<td>7.0–8.0, increasing with age</td>
</tr>
<tr>
<td>Contracted-out, funded</td>
<td>United Kingdom</td>
<td>Approved Personal Pension</td>
<td>4.6</td>
</tr>
<tr>
<td>Mandatory, unfunded</td>
<td>France</td>
<td>ARRCO (employees) AGIRC (managers)</td>
<td>14.0 min.</td>
</tr>
<tr>
<td></td>
<td>Italy</td>
<td>Notional account</td>
<td>33.0</td>
</tr>
<tr>
<td></td>
<td>Sweden</td>
<td>Notional account</td>
<td>16.5</td>
</tr>
<tr>
<td>Voluntary, group</td>
<td>Canada</td>
<td>Registered Pension Plan</td>
<td>18.0 max.</td>
</tr>
<tr>
<td></td>
<td>United Kingdom</td>
<td>Personal Pensions</td>
<td>17.5 max.</td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>401(k), profit sharing, money purchase</td>
<td>18.0 max.</td>
</tr>
<tr>
<td>Voluntary, individual</td>
<td>Canada</td>
<td>Registered Retirement Savings Plan</td>
<td>18.0 max.</td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>Individual Retirement Account</td>
<td>$4,000 ($4,500 if age 50+)</td>
</tr>
</tbody>
</table>

NOTE: There are generally minimum and maximum limitations on the earnings to which the contribution rates apply. Maximum contribution rates in voluntary plans may be lower if the worker contributes to another plan. The maximum contribution rate in the United Kingdom for Personal Pensions is higher for workers aged 40 and older. Some countries have two tiers within their social security system, or have both voluntary and mandatory plans, and thus are listed twice in the table.

SOURCE: Gillion et al. (2000); ISSA (2003).
bution plans by looking at the incentives that motivate their provision and their relationship to social security plans.

**Four Pathways to Pension Coverage: Degrees of Compulsion**

Countries have developed a dizzying variety of policies to encourage the development of both defined contribution and defined benefit plans. The resulting plans, however, can be grouped into four pathways to pension coverage; these are differentiated by the degree of incentive or compulsion provided to workers to participate in the plan (Rein and Turner 2001). In terms of degree of compulsion, these four categories include 1) unrestrained choice for the worker (including whether to participate in a pension plan), 2) a compulsory arrangement determined by collective bargaining between employers and trade unions, 3) a choice between two alternatives—participating in a pension provided either by the government or by the private sector—and 4) a government-imposed mandate. Often a country uses multiple pathways to encourage pension coverage and participation.

1) Voluntary participation, with tax incentives

The pathway the United States uses to encourage employers to provide pension coverage, both defined contribution and defined benefit, is voluntary with tax incentives. Employers are not required to provide pensions, and employees are not required to be covered. The only compulsion is that regulations stipulate that an employer who voluntarily offers a plan must cover, or offer coverage to, most or all workers.

A strength of this policy is that it maintains free choice for workers and employers. However, practically without exception, no more than half the workforce is covered in countries that use this approach (Dailey and Turner 1992). With this approach, coverage rates tend to be relatively low among low-wage workers (Hinz and Turner 1998).

A variant of this approach is automatic enrollment with an opt-out: individuals are automatically enrolled in a plan but have the option of opting out. Another variant is to require that employers offer a plan but not require that the employee participate. These two options maintain the voluntary approach but with added degrees of compulsion. These approaches are alternatives to outright mandates.
2) Collective bargaining

A second pathway to expanding pension coverage, and one with an element of mandating, is widespread collective bargaining. In some countries where all or most of the labor force is covered by a collective bargaining agreement, a high percentage of workers have pension coverage through plans resulting from collective bargaining. Countries using this approach include France, the Netherlands, Denmark, Norway, and Sweden. This strategy can only be used when a large portion of the labor force is covered by a union or where, as in the Netherlands, under law a collective bargaining agreement can be mandatorily extended to other firms in the same line of business. This approach is thus not feasible for the United States, with its low level of union membership.

3) Voluntary carve-outs

The remaining two pathways to pension coverage, voluntary carve-outs and mandatory individual accounts, are the focus of this book. The voluntary carve-out approach involves requiring participation in a retirement income plan but permits a choice between participating in social security or in an alternative private plan. With voluntary carve-outs, the employer and the worker may reduce or end their contribution to social security if the worker participates in a private sector plan that provides benefits meeting at least minimum requirements. For workers who choose the voluntary carve-out, the smaller contribution to social security lowers the benefit the worker ultimately receives from that source, but the worker receives an added benefit through the individual account. An advantage of voluntary carve-outs is that they maintain free choice, and they may encourage private sector provision of pension plans.

In Japan, voluntary carve-outs have been provided on a fairly neutral basis with respect to the incentive for participation—the government has neither subsidized nor disfavored participation. The United Kingdom, in the past, has encouraged voluntary carve-outs by providing them on a subsidized basis. Voluntary carve-out accounts were proposed for the United States by President George W. Bush in his second inaugural address and his subsequent State of the Union message.

The voluntary nature of this approach may create the problem of adverse selection. With adverse selection, the workers who most benefit
from taking a voluntary carve-out leave the social security system, eroding its financial base. For example, in the United States, depending on the way voluntary carve-outs would be structured, and on the extent to which the Social Security system redistributes income from upper-income to lower-income workers, individuals with higher incomes may be more likely to take a voluntary carve-out than those with lower incomes. For these reasons, some observers view full mandating as preferable.

4) Mandating

Mandating individual accounts is an alternative to mandatorily raising retirement income benefits by increasing the Social Security payroll tax and benefit level. While Social Security provides a uniform structure of benefits and contributions across the workforce, mandatory individual accounts generally allow greater flexibility and diversity in the types of arrangements. The mandatory approach can either compel employers to provide a pension plan for their workers or require workers to have an individual account plan with a third-party provider.

Australia and Switzerland mandate employer provision of pensions. In Sweden, the government collects the pension contributions and distributes them to the mutual funds chosen by workers, with the employer’s only role being to transmit the workers’ contributions to the government. Mandatory pension systems that supplement a traditional social security program often do not cover all workers; they may exclude low-wage, part-time, and short-tenure workers.

Relationship to Social Security

An alternative approach to understanding the different types of individual accounts is to classify them according to their relationship to social security. Pensions can either be add-ons to or carve-Outs from social security. An add-on is a pension plan that supplements the social security benefit. The social security benefit is unaffected by the provision of the add-on. A carve-out, by comparison, replaces part or all of the social security benefit (Box 2.2). In reforms that completely replace an old system with a new one (such as in Sweden), this distinction can get blurred. However, it is a major distinction in reforms such as the type being considered in the United States.
Add-ons and carve-outs can be either voluntary or mandatory. This taxonomy results in four categories of pension plans: voluntary add-ons, mandatory add-ons, voluntary carve-outs, and mandatory carve-outs. This book focuses on three of these four types of defined contribution pensions: mandatory add-ons, voluntary carve-outs, and mandatory carve-outs. Table 2.2 provides examples of countries in these categories.

**Box 2.2 The Difference between Add-On and Carve-Out Accounts**

An add-on account is an individual account that is added to an existing social security program. A carve-out account is an individual account that replaces benefits in an existing social security program. While these distinctions are clear when individual accounts are combined with social security programs that already exist, the distinctions can be fuzzy when a new social security program is enacted.

In the United Kingdom, an earnings-related social security program was not established until the 1970s. At that time, there were already well-established employer-provided defined benefit plans. Contracting out (voluntary carve-outs) was permitted to protect the existing employer-provided pensions rather than reduce the benefits in an already existing social security program.

In Sweden in 1999, an existing defined benefit social security program was replaced with a smaller program (receiving lower contributions) and new mandatory individual accounts. From the U.S. perspective, the Swedish individual account system can be considered to be an add-on because it comes on top of a generous base program supported by a payroll tax of 16 percent. Further, it does not reduce the benefits of a preexisting program since it was created at a time when a new social security program was being established. However, from the Swedish perspective, it might be considered a mandatory carve-out in that it reduces the level of contributions going to the defined-benefit social security program, relative to the old program that was replaced.
A further dimension of carve-outs is the extent to which they replace social security. Carve-outs can either partially or completely supplant the existing social security system.

The role of defined contribution pensions within the retirement income system is often expressed by the imagery of tiers of programs. The World Bank (1994) has favored a three-level approach in which the first tier is a basic government-provided benefit program designed to alleviate poverty; the second tier is a mandatory, funded, privatized program; and the third tier is a voluntary, funded program. The number of tiers in this framework can be increased by recognizing the role of an antipoverty benefit, informal intergenerational transfers, private savings, and work in old age.

The World Bank framework recognizes the important distinction between a partial replacement of social security in a three-tier system and the full replacement of social security in a single-tier or two-tier approach. With this expanded framework, individual accounts can be incorporated in a social security system in five ways: 1) voluntary carve-outs that partially replace social security (for example, in the United Kingdom), 2) voluntary carve-outs that fully replace social security (Colombia), 3) mandatory carve-outs that partially replace social security (Uruguay), 4) mandatory carve-outs that fully replace social security (Chile), and 5) mandatory add-ons to social security (Sweden). Table 2.3 provides examples of countries in the different categories of individual accounts.

The approaches that are most relevant for the debate in the United States are voluntary carve-outs that partially replace social security and

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**Table 2.2 A Simple Categorization of Types of Individual Accounts, Selected Countries**

<table>
<thead>
<tr>
<th>Relationship to social security</th>
<th>Degree of compulsion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Voluntary</td>
</tr>
<tr>
<td>Add-on</td>
<td>Canada, United States</td>
</tr>
<tr>
<td>Carve-out</td>
<td>Japan, United Kingdom, Colombia, Peru</td>
</tr>
</tbody>
</table>

mandatory add-ons. For that reason, much of this book focuses on the experience of the United Kingdom and Sweden when drawing on foreign experience. Chile is also often viewed as a model for social security reform. Although its particular form of full replacement of social security is not being seriously considered in the United States, there are lessons to be learned from aspects of its experience. Table 2.4 provides an overview of the individual accounts in these three countries.

In comparing the retirement income systems for various countries, it is important to keep in mind key economic and demographic differences. Table 2.5 compares the United States with Chile, Sweden, and the United Kingdom. Chile and Sweden have considerably less than one-tenth the population of the United States (the United Kingdom’s population is also much smaller—about one-fifth that of the United States), and Chile has much lower per capita income. The poverty rate in Sweden is markedly below that in the United States. Such factors affect the operation of the retirement income systems of these countries.

**FINANCIAL MANAGEMENT OF INDIVIDUAL ACCOUNTS**

Another dimension of the structure of individual accounts is their financial management. Both add-on and carve-out accounts can be managed at least three ways: 1) the Chilean model of individual accounts managed by pension fund companies, 2) the Australian model
<table>
<thead>
<tr>
<th>Country</th>
<th>Chile</th>
<th>Sweden</th>
<th>United Kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of DC system</strong></td>
<td>Mandatory full replacement of social security</td>
<td>Small add-on to social security</td>
<td>Voluntary carve-out from social security</td>
</tr>
<tr>
<td><strong>Role in retirement income system</strong></td>
<td>Major</td>
<td>Supplemental</td>
<td>Shared role</td>
</tr>
<tr>
<td><strong>Contribution rate for mandatory DC plan</strong></td>
<td>10%</td>
<td>2.5%</td>
<td>Variable, depending on age</td>
</tr>
<tr>
<td><strong>Centralized management</strong></td>
<td>No—management by individual pension funds</td>
<td>Yes—government clearinghouse</td>
<td>No—government clearinghouse for contributions, but individual accounts held with service providers</td>
</tr>
<tr>
<td><strong>Individual choice</strong></td>
<td>Choice of pension fund manager, each manager offers 5 different funds</td>
<td>Choice of up to 5 funds from over 600 mutual funds</td>
<td>Choice of insurance company or other service provider</td>
</tr>
<tr>
<td><strong>Rate-of-return guarantee for investments</strong></td>
<td>Guarantee relative to return received by other plans</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Rate-of-return guarantee for annuity conversion</strong></td>
<td>No</td>
<td>Yes, a minimum of 3%</td>
<td>No</td>
</tr>
<tr>
<td><strong>Mandatory annuitization</strong></td>
<td>No</td>
<td>Yes</td>
<td>Yes, at age 75</td>
</tr>
<tr>
<td><strong>Cost-of-living indexation of benefits</strong></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Mandatory survivors benefits</strong></td>
<td>Yes, for women</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Redistribution toward lower-income workers</strong></td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

*a* DC = defined contribution.

SOURCE: Author’s compilation.
of mandatory employer-provided pensions, and 3) the Swedish model of individual accounts managed by a government clearinghouse. With the Chilean model, the accounts are managed in a decentralized fashion by private sector pension fund management companies. In Chile, individual workers choose a pension fund management company and direct their employer to send their contribution to that company each month. With the Australian model, accounts are managed by individual employers, and each employer establishes a plan for company employees.

In Sweden, the government plays a major role in the management of individual accounts. The government serves as a clearinghouse to which employers send their workers’ contributions. The government also acts as a record keeper and disburses the appropriate amounts to each of the pension funds in which a worker has elected to invest.

This book does not consider mandates that require employers to provide pensions, based on the political judgment that that approach is the least likely to be chosen by the United States, and instead focuses on the Chilean and Swedish models for pension fund management. Thus, the Australian approach is not considered, though some lessons are drawn from aspects of its experience.

The Chilean model involves decentralized management by pension funds, while the Swedish model involves centralized management by a government clearinghouse. The Swedish model has the advantage of

Table 2.5 Economic and Demographic Statistics for the United States, Chile, Sweden, and the United Kingdom, 2004

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>United States</th>
<th>Chile</th>
<th>Sweden</th>
<th>United Kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (millions)</td>
<td>293</td>
<td>16</td>
<td>9</td>
<td>60</td>
</tr>
<tr>
<td>Population 65+ (%)</td>
<td>12.4</td>
<td>7.8</td>
<td>17.3</td>
<td>15.7</td>
</tr>
<tr>
<td>Life expectancy at birth (yrs.)</td>
<td>77.4</td>
<td>76.4</td>
<td>80.3</td>
<td>78.3</td>
</tr>
<tr>
<td>GDP per capita(^a) (000s $)</td>
<td>37.8</td>
<td>9.9</td>
<td>26.8</td>
<td>27.7</td>
</tr>
<tr>
<td>Population below poverty line (%)</td>
<td>12</td>
<td>21</td>
<td>1</td>
<td>17</td>
</tr>
</tbody>
</table>

\(^a\) Gross domestic product per capita.

having lower administrative costs than the Chilean model, but it involves a larger role for the government, illustrating the trade-off between these factors. Many people favoring individual accounts do so in part because they believe this policy will lead to a reduced role for the government in the provision of retirement income. With individual accounts, there may be a reduced government role in the sense that payroll taxes are reduced, but at the same time the government bureaucracy may grow because of the role of the government clearinghouse.

ELEVEN RISKS IN MANDATORY INDIVIDUAL ACCOUNTS

The risks in individual accounts should be viewed in the context of all sources of retirement income a worker expects to receive. The risks are greater if the individual accounts replace a stable base of social security benefits than if the individual accounts are an add-on to social security. It may be optimal for most workers to diversify and bear the risks both of the traditional social security program and of financial market assets, though that does not necessarily imply a mandated individual account system.

While financial market risks are clearly an issue with individual accounts, there are numerous other kinds of contingencies that are less frequently considered. Many of the concerns regarding risks in individual accounts do not even arise in defined benefit plans. This section introduces the types of risk that affect pension participants in individual accounts. The topic is dealt with in greater detail subsequently in the book.

Individual accounts can be invested in government bonds and constructed with various guarantees, and thus some of the risks they commonly entail are not necessarily inherent. Adding guarantees, however, imposes a cost that lowers the expected rate of return.

Risks while Working

Investment risk

In individual accounts, financial market risk has traditionally been borne entirely by the worker, while in employer-provided defined ben-
Benefit plans it is primarily borne by the employer or by an insurance company. The increasing role of individual accounts, both as voluntary and as mandatory plans, raises the importance of the financial risk-bearing by workers and retirees. Some analysts argue that individual accounts, when they are the primary source of retirement income, place too much financial market risk on workers (Ferguson and Blackwell 1995). When these accounts play a minor role, however, being provided on top of a secure, low-risk base of traditional social security and a defined benefit employer-provided pension plan, the concerns are less serious.

Especially for low-income workers who rely to a large extent on social security benefits for retirement, it is important that this source provide stable benefits, at least for a substantial part of retirement income. Workers generally are risk-averse, and some—women, low-income workers, and those with limited education—are especially so (Hinz, McCarthy, and Turner 1996). Others, however, argue that the greater financial risk the worker assumes with individual accounts is more than offset by increased expected benefit levels (Feldstein, Rangelova, and Samwick 1999).

Investment risk arises in financial markets because of the changes in the real (inflation-adjusted) value of assets and their rates of return. The risk of a stock market bubble may result from “irrational exuberance” by investors. The potential for loss can be reduced at the expense of expected rates of return by investing in more secure assets such as government bonds, by purchasing an insurance company product, or by establishing rate-of-return guarantees (discussed in Appendix A).

If a person were to maintain a constant portfolio mix over his or her career, the possibility of a large loss would increase as the worker came closer to retirement because the account balance would be larger. Workers can offset this risk by gradually moving into bonds, but because of inertia it appears that many do not make that change (Turner 2003).

By contrast, as workers approach retirement age, the risk of a large loss in social security decreases. This occurs for two reasons. First, in the United States, Social Security benefits are based on an individual’s career average earnings, and most of those amounts would already be known as a worker got closer to retirement. Second, most reform proposals are designed so that they do not affect workers aged 55 and older; thus, the chance of legislative changes altering benefits is considerably less for older workers than for younger workers.
Agency risk

In addition to financial market risk on stock investments arising from swings in the macroeconomy, individual account participants are also subject to losses from improper financial management of their investments. Agency risk occurs because the pension participant’s investments are handled by agents rather than directly by the individual. The agents include mutual funds and the corporations whose shares the pension participant holds. This risk is borne by the plan sponsor in funded defined benefit plans but by the worker in individual accounts.

Individual management risk

Individual management risk arises from individual errors in managing pension investments. Evidence has accumulated that many individuals systematically make errors in managing pension investments, and that these errors affect their retirement income (Turner 2003). An example of individual management risk is the tendency of some people to buy a stock or mutual fund after its price has risen and to sell it after its price has fallen, resulting in a buy-high-and-sell-low pattern. Individual management risk does not occur in traditional defined benefit social security plans but does arise in individual account plans.

Policy risk

Policy risk results from changes in national tax and retirement income policy that affect the level of benefits received from a pension. Such changes can affect participants in both defined benefit plans and individual accounts. In the voluntary carve-out plans in the United Kingdom, every five years the Government Actuary’s Department (GAD) resets the key parameter determining the generosity of the benefits received from social security and from the carve-out individual account. Public policy risk is greater in many countries for young participants in traditional social security programs than for those in individual accounts. As previously discussed, financial risk is typically higher than policy risk for workers near retirement.
Risk of adverse labor market outcomes

The unemployment risk to retirement income stems from the worker experiencing periods of joblessness. Unemployment and being out of the labor force have less of an impact on benefits in the U.S. Social Security program than they do in an individual account plan because benefits are based on a person’s 35 highest years of earnings. At least for many individuals who have full careers of work, a period of unemployment may have no effect on their Social Security retirement benefits but would affect benefits in an individual account plan.

Retirement benefits are influenced more by unemployment when workers are young than when they are old because of the impact of interest compounding. Related to this, being out of the labor force for any reason has a bigger effect on retirement benefits for workers in an individual account when they are young than when they are old. For example, young women who take off time to rear children may greatly reduce their retirement benefits in an individual account plan.

Related to unemployment risk is the possibility of receiving lower pay than expected. This could be due to changes in the fortunes of the employer or industry where one works, or it could be because of personal issues such as poor health. Defined benefit social security plans provide insurance against these situations since their benefit formula is designed to provide redistribution to lower-earning workers.

Risk of disability

The risk of becoming disabled before retirement and unable to work is not dealt with by individual accounts. Workers who become disabled at a young age only have the amount that has accumulated in their accounts. This contingency must be dealt with outside individual accounts through the purchase of disability insurance.

Risk of premature death

The risk of premature death is that of dying young and leaving behind juvenile dependents (Nyce and Schieber 2005). Defined contribution plans deal poorly with this possibility because a worker who dies young likely would not have accumulated sufficient assets to provide for children. A defined benefit social security program can cover this by including survivor benefits for young workers, which provide bet-
ter protection. With individual accounts, this situation must be handled separately through the purchase of survivors insurance.

**Risks at and in Retirement**

**Replacement rate risk**

Replacement rate risk involves the possibility that workers will have a lower income replacement rate than expected. The income replacement rate is the percentage of preretirement earnings provided by retirement income and is affected by the risks associated with both the financial market and the worker’s preretirement earnings. In defined benefit plans the worker bears part of this risk (the part arising because of uncertain wages), and in individual accounts the worker completely bears the risk.

**Annuitization (interest rate) risk**

An annuity is a stream of benefits received for life. Individuals may be required in an individual account system to convert their account balances into an annuity by using the account balance to purchase an annuity from a life insurance company. Annuitization risk arises because of changes in interest rates and reflects the possibility that the individual annuitizes his or her account balance when interest rates are down, resulting in low annual benefits. Annuitization risk does not arise in defined benefit social security plans because they delineate the benefit level irrespective of the level of interest rates.

**Longevity risk**

Longevity risk for workers occurs both before and during retirement, and it has both a cohort and an individual component. First, there is the element related to changing cohort mortality rates up to the point of retirement. This situation affects the annuity value if the individual decides to annuitize the account balance, or the amount the person can take out through phased withdrawals if not choosing to annuitize. Second, longevity risk after retirement for people who annuitize their individual accounts is borne by the annuity provider, typically an insurance company. Alternatively, individuals who do not annuitize their account balances face the prospect of living longer than expected and not hav-
ing sufficient funds. Both aspects of longevity risk are borne by the plan sponsor in defined benefit plans providing annuitized benefits.

**Inflation risk**

Inflation risk arises from price level increases that occur after retirement. Generally, capital market assets keep pace with inflation, so that concern is not an important issue before retirement for reasonable levels of inflation. However, if benefits are not price-indexed, inflation after retirement will erode their real value. Traditional defined benefit social security plans usually provide full price-indexing, while that typically is not provided in individual accounts, although Chile and the United Kingdom are exceptions.

**Risks Affecting Pay-as-You-Go Social Security**

There are also risks that affect pay-as-you-go defined benefit plans but do not affect individual accounts and funded defined benefit plans. One example is dependency rate risk, which reflects shifts in population age structure that occur because of changes in rates of birth and mortality. The old-age dependency ratio can be measured as the ratio of retirees to workers. It acts as a shadow price for social security benefits (Turner 1984). If there is one retiree for every four workers, it costs each worker \$0.25 to raise the benefit level of the retirees by \$1. If the old-age dependency ratio doubles and there is one retiree for every two workers, it costs each worker \$0.50 to raise the benefit level of retirees by \$1. Pay-as-you-go defined benefit plans are subject to the risk of changes in the old-age dependency ratio, while individual accounts are not.

In sum, when considering different ways of providing social security benefits, in nearly all respects individual accounts are riskier than a well-managed defined benefit social security plan such as is found in the United States. This is true for risks related to the issues of individual management investments, adverse labor market outcomes, disability, premature death, earnings replacement, annuitization, longevity, and inflation. Traditional social security plans are riskier for older workers with respect to changes in the old-age dependency rule, and for younger workers with respect to changes in public policy.
CONCLUSIONS

Individual accounts can be categorized either with respect to the incentive for their provision or with respect to their relationship to social security pensions. Combining these two approaches, social security reform using individual accounts can occur in five different ways: 1) voluntary carve-outs that partially replace social security (United Kingdom), 2) voluntary carve-outs that fully replace social security (Colombia), 3) mandatory add-ons to social security (Sweden), 4) mandatory carve-outs that partially replace social security (Uruguay), and 5) mandatory carve-outs that fully replace social security (Chile). Of these approaches, this book, in the context of possible U.S. reforms, focuses on three: voluntary carve-outs that partially replace social security, mandatory add-ons, and mandatory carve-outs that partially replace social security. The effects of individual accounts depend on which type of account is being considered. It is important to distinguish between add-ons and carve-outs.

Another dimension of the structure of individual accounts is their financial management. For either add-on or carve-out accounts, individual accounts can be managed in at least three ways: by using the Chilean model, the Australian model, or the Swedish model. This book focuses on the Chilean and Swedish models of financial management as being the approaches most relevant for the United States to consider. When considering overall approaches, the book focuses on Sweden and the United Kingdom as leading examples of the add-on and carve-out approaches.