Pension Policy in China, Singapore, and South Korea: An Assessment of the Potential Value of the Notional Defined Contribution Model

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Abstract

The rate of population aging is increasing in the developing world and the trend is particularly dramatic in East Asia. One consequence is sharp increases in old-age dependency ratios which has major implications for the sustainability of current public pension schemes. These trends are pushing pension policy experts in many of these countries to search for new pension models that are more suited to the increased demographic pressures they will be facing in the decades ahead. In this article we discuss five alternative public pension models with a focus on the newest of these models, the notional defined contribution (NDC) approach. We consider three countries with very different pension systems in place, two from East Asia (China and South Korea) and one from South East Asia (Singapore). The central question we address is which (if any) of the limitations in these existing models might more adequately be addressed using a variant of the NDC model. We conclude that the NDC model has the most to offer China and the least to offer Singapore.

Key Words: public pension policy; notional defined contribution; China; South Korea; Singapore; social security
Rapid population aging is underway in the OECD countries and in most other countries around the world. With each passing decade concern is growing about how to assure adequate old-age security for an ever-increasing number of old people. This demographic trend has a variety of long-term policy implications. Our focus will be on one of the most important, pension policy. In many countries old-age pension schemes that seemed to be working relatively smoothly are starting to falter, due in part to current and projected demographic trends and in part to system maturation. During the early years of new pension systems, particularly those based largely on the pay-as-you-go defined benefit (PAYG-DB) model, relatively few people are eligible for pension benefits while many more are making contributions. But as these systems mature and the number of workers eligible for pensions dramatically increases, questions about sustainability start to emerge. In recent years, these trends have in driven pension experts around the world to search for alternative models that are more suitable for a world characterized by population aging in the context of economic globalization. A number of new approaches to old-age security are currently under study. In this article we will be exploring several of them with a particular focus on one that we believe deserves much more attention than it has received to date, the Notional Defined Contribution (NDC) approach.

While population aging is underway around the world, this demographic trend and the implications of the trend for pension policy are particularly pressing in East Asia. For purposes of this paper that designation should be understood to also include the nations of South East Asia that are sometimes classified as East Asian as well as those further to the north that are always classified as East Asian. There is not full agreement among experts and international agencies as to which countries should be included in
East Asia and which in South East Asia, but generally China and South Korea are classified as being in “East Asia” and Singapore as being in “South East Asia.”

There are a number of reasons to pick China, South Korea, and Singapore for our analysis. Some welfare state theorists argue that these countries illustrate three different welfare state models that have become dominant in the region with Singapore representing the provident fund cluster, South Korea representing the social insurance (PAYG-DB) cluster, and China representing a third “evolving approach” that draws ideas from both of the others (Kwon, 2009). As our primary goal is to compare the NDC model with the major alternatives to the NDC pension policy, we preferred this set countries in large part because it made it possible, based on just three countries, to explore the potential utility of the NDC model relative to all of the other major pension models currently in place in East Asia today: PAYG-DB model (South Korea, China), the provident fund model (Singapore), the funded defined contribution (FDC) model (China), and noncontributory social pension model (South Korea, China). Another reason for our choice of these countries is that all three are currently being forced to deal with very serious fiscal pressures associated with rapid population ageing. This is a major problem for much of East Asia, but it is particularly problematic for these three countries. They are in the vanguard among East Asian nations with respect to having to deal with the consequences of rapid population aging (See Table 1). We selected countries that were rapidly aging because the pension policy consequences of rapid population aging are likely to be the most pressing for such countries. The three countries also vary dramatically in size (China at 1.3 billion; South Korea at 49 million, and Singapore 5 million). This difference is, however, not a dimension that we focus on, as we already
know that the NDC model can function well in countries that vary a great deal with respect to total population (e.g., Sweden vs. Russia).

We will be asking whether it would make sense for policy makers in these countries to give serious consideration to the NDC model. In most countries (Mongolia is the one exception) that have introduced an NDC based pension, it is included as one pillar in a multi-pillar national pension scheme. For this reason here we will be addressing a more limited question: would it make sense in any of these three countries to add an NDC pillar to the existing pension scheme? While our focus is on assessing the potential utility of an NDC pillar our discussion is not limited to consideration of the NDC approach alone. As will become evident, we are going to suggest that in some of these countries the need may be as great, and maybe even greater, to consider introducing a new social pension pillar or making changes in an existing social pension pillar. In this article we will use the term “social pension” to refer to noncontributory old-age pensions, and there will be two categories of social pensions, universal social pensions and means-tested social pensions.

We begin with a discussion of some evidence about the seriousness of the demographic pressures that all three of these East Asian countries are facing. The statistics presented in Table 1 are author calculations using country level data drawn from two databases (U.S. Census Bureau, 2010; World Bank, 2006). The statistics show that the percentage of the world’s population age 65 and over has increased substantially since 1960 and suggest that this trend will continue in the decades ahead. In this table we also include data on the old-age dependency ratio (hereafter OADR) as a second measure of population aging. The OADR is the population aged 65 and over divided by the
working age (15-64) population. This provides an aggregate estimate, albeit a crude estimate, of the number of dependent old people relative to the number of younger adults supporting them. The data in Table 1 on trends in the OADR suggests that we should expect serious age-related demographic pressures throughout the world in the decades ahead. This data points to a likely increase in the macro level public burden associated with increased government spending on pensions and health care for the older population and micro level familial burdens associated with providing various forms of financial aid and personal care to elder family members. As population aging continues, it is likely to become increasingly difficult for younger generations to provide older generations with the financial, medical, and personal care support they will need.

(Table 1 goes about here)

This table also shows that population aging is occurring particularly rapidly in the three countries that we have selected for our analysis—South Korea, China, and Singapore. It is of note that the trend in Singapore (a South East Asian country) is similar to that for South Korea and China (East Asian countries). South Korea’s pension scheme is a partially funded pay-as-you-go defined benefit (PAYG-DB) social insurance based pension model (SSA, 2009; Moon, 2008). It differs from similar programs in most other OECD nations in two particularly important respects-- it is partially funded and it was very recently introduced (1988). Due in part to these two differences, Korea will not be facing the full brunt of system maturation for a few more decades. Despite these two advantages, and in part related to them, the country is already facing some serious issues related to providing adequate retirement security for residents who are already old (Moon, 2008). China’s somewhat unique decentralized public/employer variant of the
PAYG-DB model for urban workers can be traced back to 1951. Between 1997 and 2005, a number of major structural changes were made that largely framed the current multi-pillar scheme, including the introduction of a substantial funded defined contribution (FDC) component (Impavido, Hu, & Li, 2009). Until recently, there was very little pension coverage for the rural population in China, but this is changing, and a rural pension scheme is being implemented that, for those who are currently of retirement age, is largely based on the universal social pension model (Williamson, Shen, & Yang, 2009). Singapore’s system, which can be traced back to 1955, is one of the world’s most successful national provident fund schemes (Dixon, 1993; Asher & Young, 1997).

Since the 1990s the search for new pension models was greatly influenced by developments in Latin America, particularly in Chile. In 1981 Chile began its transition from a mature PAYG-DB public pension scheme (which had been running huge deficits) to a multi-pillar scheme that included a substantial funded defined contribution (FDC) pillar (Barr & Diamond, 2008; Kritzer, 2008; Williamson, 2005). Within a few years, the World Bank and a number of other international financial institutions began to promote variants of this model for many other countries around the world, particularly those with traditional PAYG-DB schemes that were or were becoming unsustainable (World Bank, 1994).

Today there are more than thirty pension schemes around the world that include an FDC pillar (James, 2005). A second and more recent alternative that is also emerging is the notional (or non-financial) defined contribution (NDC) model (Holzmann & Palmer, 2006). It too is now in various stages of implementation in an increasing number of countries around the world, but primarily in the West. We have picked our three
countries as case studies to help us explore the potential feasibility and utility of the NDC model for East and South East Asian public pension schemes.

The evidence used in this paper with respect to developments in China, Singapore, and South Korea is largely drawn from the sources cited in our references including historical accounts as well as government reports and documents. In the case of China these sources were supplemented with evidence drawn from Chinese newspaper accounts and interviews over the past three years with a number of Chinese pension scholars, rural area officials, and some farmers. Most interviews were conducted in the Shanghai area, Beijing, Chengdu, or Liaoning province.

Five Public Pension Models

Five basic public pension models are relevant to the discussion presented in this article: (1) the pay-as-you-go defined benefit (PAYG-DB) model, (2) the funded defined contribution (FDC) model, (3) the provident fund model, (4) the social pension model, and (5) the notional defined contribution (NDC) model. In general, each attempts to address the question of old-age security in a different way with varying degrees of governmental and individual responsibility.

Defined benefit (PAYG-DB) models

With public defined-benefit (PAYG-DB) schemes, pensions for current retirees are funded largely or entirely by payroll taxes on the current working population and their employers. Generally they operate on a largely unfunded basis referred to as pay-as-you go (PAYG), but many include at least a modest trust fund with the reserves needed to deal with temporary cash flow problems. When the reserves in the trust fund become substantial, the scheme is described as being partially funded. Pension benefits received at retirement are typically based on the number of years of contribution to the system and a measure of average or final earnings. This model worked well in many countries for several decades immediately
following the Second World War, the era when most such schemes currently in place around the world were implemented or greatly expanded; but in recent decades serious questions have emerged with respect to the fiscal sustainability of many of these schemes. This has been due to a number of factors including system maturation, demographic changes (population aging), and increasingly competitive global markets (Clark, Munnell, & Orszag, 2006; Myles & Pierson, 2001). These trends have stimulated efforts by public pension experts in many countries around the world to find alternative models that are both politically and economically more sustainable.

**Funded defined contribution (FDC) models**

FDC models provide old-age security based on individual accounts funded by contributions from covered workers and/or their employers and the market earnings on those accounts over the years (James, 2005; Hateley & Tan, 2003). Supporters of this model point out that it offers a mechanism for reducing the fiscal burden on the government, particularly due to: (1) demographic shifts, (2) tendencies to promise future benefit levels that cannot be sustained without sharp increases in payroll tax rates, and (3) periods of negative or slow economic growth. With this model benefits are more directly tied to the actual contributions to the pension scheme than is the case with most PAYG-DB schemes currently in place. FDC schemes are typically introduced as one pillar in a multi-pillar pension system, as part of an effort to reduce public pension spending. Some who support such efforts argue that if the funds in the FDC accounts are invested wisely, covered workers should over the long run end up with more generous pensions than if they had been covered by the traditional PAYG-DB scheme. They also argue that such schemes provide incentives for workers to spend more years in the labor force and fewer years in retirement being supported by others.

Critics argue that FDC schemes shift the risk from the government to the individual workers in ways that often leave many workers, particularly low-wage workers, much more vulnerable than they would have been under prior PAYG-DB schemes, even if some combination of benefit cuts and payroll tax increases would have been necessary to keep the prior PAYG-DB scheme in fiscal balance (Williamson, et al., 2009; Barr & Diamond, 2008). The increased risk is due to several factors including: (1) the often low level of the contributions and the frequency with which contributions are skipped, particularly by low-wage
workers, (2) the weakening of pension provisions calling for income redistribution to compensate for the modest level of savings that most low-wage workers are able to accumulate prior to retirement, and (3) the potential consequences of dramatic swings in financial markets on these accounts, particularly during the period immediately preceding planned or mandatory retirement (Burtless, 2003). Another criticism is that such schemes often place too much emphasis on the goals of stimulating economic growth and too little emphasis on assuring predictable and adequate levels of old-age security for individual workers. Kritzer (2008) notes that in Chile—the country that initially championed the FDC model—a large portion of the workforce (39%) ends up with little or no coverage. Informal sector workers, the unemployed, and women often do not do well under FDC schemes. This model works best for workers who are fully employed in steady and well-paying jobs over their entire work histories (Kritzer, 2008; Inter-American Development Bank, 2008).

**Provident fund models**

National provident funds are compulsory defined contribution schemes administrated by the government. They are often found in former British colonies such as Singapore, Malaysia, and India (Asher, 1998). A provident like an FDC pillar is funded, but the assets are managed by the government and typically invested largely in government bonds. As the government sets the rates on those bonds, they often end up paying below market rates of return (Midgley & Sheridan, 1997). In addition to low rates of return on investments, these schemes have often had high administrative costs. Benefits are sometimes paid as an annuity, but often paid in part or in whole as a lump sum. A major risk associated with this alternative is that the money will be used up quickly, leaving workers with inadequate funds to live on during their later retirement years (Turner, 2001). Over the years Singapore’s provident fund has generally fared better than those in most other countries that have based their old-age security systems on the provident fund model. While the real rate of return has generally been low, it has also generally been positive (Asher, 2010; Williamson & Pampel, 1998).
**Social pension models**

Old-age social pensions are noncontributory pensions designed to reduce the degree and/or prevalence of poverty in the older population. Social pensions are either universal or means-tested. Universal social pensions (sometimes referred to as citizens’ pensions) provide coverage for all residents (or citizens) over a specified age (Barr & Diamond, 2008). Such schemes are more common in countries that lack a mandated contributory pension system. Means-tested social pensions (sometimes referred to as social assistance pensions) operate as safety nets, providing full coverage only for those whose incomes fall below a specified level (Palacios & Sluchynsky, 2006). In some countries such as Namibia the public old-age security system is entirely based on the universal social pension this model and in others, such as South Africa, in rural areas it is based on a means-tested social pension (Johnson & Williamson, 2006). The beneficiaries of social pensions typically include those working in the informal sector of the economy, irregular and seasonal workers, rural workers, those not covered by a mandatory pension system, women (particularly widows), and those who have been impoverished throughout their adult lives more generally (Palacios & Sluchynsky, 2006). In many countries the success of social pension programs has been limited by various administrative challenges. Means-tested social pensions often involve substantial spending on administrative efforts to determine who qualifies as poor, while universal pensions are often viewed as being too costly in many poor countries (Holzmann & Hinz, 2005).

**Notional defined contribution (NDC) models**

NDC plans are generally incorporated as one pillar of multi-pillar schemes that also include pillars based on other models such as a mandatory FDC pillar and/or a social
pension pillar. NDC schemes draw on various elements of both PAYG-DB and FDC models. They are designed to create a closer link between contributions made and benefits received than do most PAYG-DB schemes. In the NDC model, workers make payroll tax contributions that may be at least partially matched by employer contributions. The amount contributed by or in the name of a specific worker is recorded in the worker’s individual notional (unfunded) account, but the money is used to pay pensions to those who are currently retired, reflecting the PAYG-DB nature of the model (Palmer, 2006). The actual funds are not invested in financial markets. The notional “assets” or credit in these accounts are indexed to adjust for changes in price levels, wage levels, the wage sum (which is a function of both wage levels and the number of workers contributing), or the rate of economic growth (Williamson & Williams, 2005). The starting annuity benefit received at retirement is based largely on the size of the notional account and the average life expectancy for the worker’s age cohort. After the pension begins, it is typically adjusted annually in ways that reflect how well the economy has been doing, a provision that contributes to a sharing of economic gains or reverses between retired workers and those still at work (Barr & Diamond, 2008; Williamson, 2004). Because the “interest” earned on an NDC account is based on nonfinancial indexing mechanisms, NDCs often produce lower rates of return than do funded systems, particularly when capital markets are doing well. The trade-off with an NDC scheme is that its indexing mechanisms produce outcomes that are generally much less volatile than equity markets, such as the sharp correction in equity markets in many parts of the world during 2008. NDC pillars are not redistributive and generally favor men and formal sector workers. In this sense they reflect some of the logic of FDC pillars (Williamson &
Williams, 2005). NDC schemes have been introduced in several countries including Sweden, Italy, Poland, Russia, Latvia, Slovakia, Croatia, Kyrgyzstan, Kazakhstan, and Mongolia.

**Three Case Studies: South Korea, China, and Singapore**

The case studies of South Korea, China, and Singapore can be used to highlight some of the strengths and limitations of several pension models currently in use in some East and South East Asian countries, specifically the PAYG-DB model, the funded defined contribution (FDC) model, the social pension model, and the provident fund model. South Korea’s pension plan faces serious problems today with respect to the adequacy of old-age security benefits for those who are retired or soon will be. China is facing serious short- and long-term financing issues due to very rapid population aging linked in part to its one-child policy. Singapore has provided a great deal of flexibility with respect to how provident fund savings can be used to meet various categories of predictable financial needs across the adult life-course, but one consequence is that workers face the risk of a sharp drop in standard in living when they retire. Many find that they do not have enough savings to buy an annuity that will assure a retirement standard of living comparable to their pre-retirement standard. After briefly reviewing the current pension scheme in each of these countries, we will, in each case, ask whether or not it would make sense to consider adding an NDC pillar to that country’s old-age pension scheme.

**South Korea**

Prior to 2007 the two major government programs providing old-age security in the Republic of Korea (South Korea) were: (1) the partially-funded PAYG-DB National Pension Scheme (NPS), a social insurance program (introduced in 1988) and (2) the National Basic Livelihood Security (NBLS) program
(introduced in 2000), a means tested social pension not limited to the older population (SSA, 2009, Moon, 2009). Many of the elderly poor were not able to meet the eligibility criteria for either of these programs. In 2007, as part of the effort to deal with the lack of adequate old-age security provided by the NPS and NBLS programs, a new noncontributory program, the (3) Basic Old Age Pension was introduced. It is a modest affluence-tested social pension; that is, the eligibility provisions exclude those in approximately the top 30% of the income distribution (Moon, 2008).

For the NPS the basic pension amount (BPA) is determined by both the worker’s average indexed monthly wage over the total contribution period and the three-year average national monthly wage for all workers at the time of retirement (SSA 2009). Due to the relative “newness” of this system, contributions currently exceed benefit payments and the surplus is being used to build up a trust fund, some of which is invested outside the country (Jung & Walker, 2009). The original benefit formula promised what many experts now consider an overly generous income replacement rate (60% for the average worker after 40 years of contribution) relative to the size of the payroll tax contributions (Kwon, 2002; World Bank, 2000). Over the years subsequent legislation has already reduced the replacement rate to 50%, and it is currently scheduled to fall further to 40% by 2028 (Moon 2009). Despite these benefit cuts, due to the increase in the number of workers who will become eligible for NPS benefits during the decades ahead, benefit payments will soon be exceeding contributions, unless further cuts are made. In short, South Korea faces a serious long-term sustainability problem.

The NPS pension is the most generous of the three schemes, but even its benefit levels are currently low because the program has been in place for just over twenty years. Many workers have not contributed for the required 20 years and have opted instead for a reduced pension based on 10-19 years of coverage. But there are other factors also tending to reduce the NPS benefit level. NPS regulations allow many (currently 28%) covered workers a “grace period”; that is, they are not required to contribute if they “cannot afford” their contributions. This provision means that when these workers retire, their pension benefits will be lower due to periods of not contributing (Moon, 2008). In addition, many of the self-employed, those working in the informal sector, and those working for small businesses are evading their mandatory NPS contributions, which again will lead to lower NPS pension benefits (Kang & Lee, 2009).

China
For many decades the Chinese public pension system has been designed primarily to cover urban workers, particularly government workers and those employed in state owned enterprises. While the Chinese pension system currently covers only about half of the urban population and about a quarter of the rural population, it is likely that coverage will be increasing rapidly in the years ahead (People’s Daily, 2011). The urban system can be traced back to 1951, but the framework for this system was largely put in place by a series of reforms between 1997 and 2000 (Impavido et al., 2009). Currently, an effort is also being made to introduce a major new and quite separate pension scheme in rural areas. The goal is to have this scheme in place throughout rural China by 2020, but as it is voluntary, coverage will, in all probability, be much lower than that associated with the mandatory urban scheme (Shen & Williamson, 2010). In addition to these two schemes there is a third government scheme that covers government workers. By 2008 an estimated 40% of the Chinese labor force were covered by one of the three government pension programs: (1) the urban pension scheme (also called the Basic Old Age Insurance system) (28%), (2) the rural pension system (7%), and the pension plans for government workers and those working in public institutions, such as schools and hospitals (5%) (Impavido et al., 2009). We will focus on the first two of these programs.

**China’s urban pension program**

The urban pension scheme is referred to as Pillar I (out of three). It is divided into two tiers. The first is a PAYG-DB plan financed entirely by employers, with a maximum contribution of 20% of the payroll (in most areas). The second tier of Pillar I is an FDC plan calling for mandatory individual accounts. These accounts are entirely financed by employees who must contribute 8% of their earnings (SSA, 2009). Upon retirement, covered workers receive monthly benefits derived from both tiers of Pillar I.

Pillar II is the Enterprise Annuity System. These are fully funded defined contribution occupational pensions that tend to be established by the more profitable firms, including private and joint venture firms (Impavido et al., 2009). Tax incentives are used to foster the introduction of such schemes. They are subject to government regulation, but are not considered government programs. Pillar III refers to unregulated individual savings plans.
Prior to 1995, China’s pension system operated under a strictly PAYG-DB basis. Since then changes have been made because it was clear that the scheme was not sustainable. The transition to the current multi-pillar system has not been easy as there have been many problems associated with providing pensions for workers who were covered by state owned enterprises that have been downsized or shut down (James, 2002). The central government is unable to finance more than a fraction of the pension benefits due these retirees. It is the local and provincial governments that have in large measure charged with financing the transition, and as a result, a city-wide pooling process has been used in many areas to assure pension coverage for retired workers from downsized and closed SOEs. This pooling and redistribution at the city and provincial levels is carried out in the context of a social security system that is highly decentralized with different regulations and different benefit schedules in different provinces (Frazier, 2004). These difficulties have translated into the general public’s lack of confidence in the pension system and to a considerable amount of pension related tax evasion (Zhao & Xu, 2002).

Of particular note in recent years has been the need to redirect funds collected from employees, that by statute were to be used to fund individual retirement savings accounts, to be used instead to fund pensions for current retirees, leaving many individual accounts basically unfunded. These workers are being told that a record is being kept of their contributions and that they will eventually get pension benefits based in part on these contributions and interest credited to these accounts. The diversion of these contributions has transformed these individual account FDC pillars into what can be described as a variant of the notional defined contribution (NDC) model (Williamson et al., 2009). However, the trend is away from these unfunded accounts and the practice is reported to have ended in 13 of China’s provinces (Impavido et al., 2009).

To the extent that the current structure of the urban pension system in China includes mandatory contributions to individual FDC accounts that often go largely unfunded, there is the risk that workers will lose confidence in the pension system due to the lack of transparency with respect to what is going on with these accounts. But there are also potential risks associated with those FDC accounts that are funded or at least partially funded. Currently the funds are placed in government-controlled banks with the government banks deciding what interest will be paid. This puts such accounts at risk of ending up with interest payments at retirement that are below what they would have been had interest payments been based on
market rates. This has been a problem in many nations with national provident fund schemes. But this Chinese policy does have the advantage of protecting these assets from the market manipulation and volatility often found in developing nations. While Chinese financial markets have had their problems in recent decades (Bhattasali, 2002; Lardy, 2003; James, 2002), it is of note that they performed well compared to those in many OECD nations during the 2008 bear market.

**China’s new rural pension program**

The new rural pension scheme currently being implemented in China is a voluntary program that combines a noncontributory social pension (the basic pension) pillar financed by the local and central government with an FDC personal account pillar financed by lifetime contributions from the enrolled worker. The original plan was to cover 50% of rural regions by the end of 2012 and 100% by 2020 (People’s Daily, 2009). However, as of mid 2011, approximately 199 million rural residents in China were covered by the scheme and 60 percent of rural regions were already at least partially covered (People’s Daily, 2011). At the same time approximately 24% of the rural Chinese population was covered. One of the Chinese pension experts we interviewed in Beijing estimates that in the rural areas currently approximately (37 million elders or 40% of those age 60 and over were already receiving pension benefits from the new rural pension scheme.

The basic pension component varies from region to region and is set at a level close to the poverty level in each local region (Shen and Williamson, 2010). For poorer provinces the central government contributes a greater share of the cost than it does in more affluent provinces. In some of the poorest regions the central government contributes 100% and in some of the most affluent regions it contributes about 50% (People’s Daily, 2009). To become eligible for a pension, enrolled workers much be age
60 (55 for women) and have contributed for at least 15 years. The final pension is based in part on the social pension component financed by the central and local government and in part of the amount accumulated in the FDC account the worker has accumulated prior to taking the pension. An exception is made for those over age 60 at the time the program is introduced in the local area. They are eligible for the basic pension without having made any contributions to the FDC component, but only if their children age 16 and over (who are not students) are enrolled in the program (People’s Daily, 2009).

**Singapore**

Singapore’s Central Provident Fund (CPF) was implemented in 1955. It is a mandatory, individual account-based scheme (SSA, 2009). The CPF has three separate accounts—the Ordinary, Special, and Medisave. Savings can be withdrawn as a lump sum from the Ordinary and Special accounts at age 55 after meeting a Minimum Sum requirement. In early 2010 the Minimum Sum was SGD 117,000 (USD 85,700) (CPF Board, 2010). A separate Retirement account is created at age 55 with transfers from the Ordinary and Special accounts of at least the Minimum Sum amount for those who have sufficient funds in their other CPF accounts. Members can start to draw down the assets in their Retirement accounts in their early 60s. One option allows monthly amounts to be withdrawn that will last for about 20 years. Another is to purchase an annuity that will last a lifetime.

Despite the Minimum Sum requirement, concerns have been raised about the CPF’s ability to provide a sufficient guard against old age poverty. The CPF allows participants to withdraw funds from the Ordinary and Special accounts before age 55 for certain investments, including home ownership, college education, insurance, and “topping-up” the retirement funds of elderly parents (CPF Board, 2010). These investments can render participants asset rich (due to home ownership), but cash poor in retirement (Hateley & Tan, 2003). In the view of some analysts, the Ordinary and Special accounts do not address the “longevity risk” associated with longer life expectancy by virtue of their lump sum payment provisions at age 55 (for amounts over the Minimum Sum). Looking to the future, it is clear that a good portion of participants’ savings will have to be stretched over a longer period of time after retirement (Heller, 2006). In an effort to address this problem, Singapore launched a new program in 2009 called “CPF LIFE”
(Lifelong Income for the Elderly) which will guarantee CPF members a monthly lifetime annuity derived from the Retirement account (CPF, 2009). This government program is funded by using transfers from the participant’s Retirement account. The actual size of the CPF LIFE annuity is quite modest, currently between SGD 172-444 (USD 126-325) per month.

Accumulated funds in the CPF are invested by the CPF Board into “safe investments,” primarily government bonds. Singapore allows a certain degree of freedom for participants to determine how to invest their CPF funds, but the options are limited by the government (CPF Board, 2010). The CPF often offers returns that substantially lag trends in real wages (Asher, 2010). This translates into low pension benefits and often into being dependent on one’s adult children for financial support in old age (Hateley & Tan, 2003). While Singapore has historically been successful in producing positive rates of return, during the past few years, Singapore’s rate of inflation has been higher than the CPF’s rate of return. In 2008, Singapore’s inflation rate was 6.5% while the interest rate ranged from 2.5% to 4% depending on the CPF account in question (CPF Board, 2010; Singapore Department of Statistics, 2009).

Finally, Singapore’s government encourages individual self-reliance and discourages dependence on government financed welfare. This often leaves Singapore’s poorest, who are likely unable to actively contribute to the CPF, no alternative to reliance on the philanthropic efforts of various non profit organizations and Community Development Councils (CDCs)—district-based community planning organizations—for social assistance (Mendes, 2007).

Assessing the potential utility of the NDC model

The pension schemes currently used in South Korea, China, and Singapore each have strengths and each have their limitations. In this section we ask whether the addition of an NDC pillar could strengthen any of these schemes.

Would South Korea benefit?

As mentioned earlier, one problem confronting the South Korean old-age pension plan is sustainability. The 2007 amendments to the National Pension Act represented a major step toward dealing with the short-term sustainability problem. However, even
with the major cuts in promises with respected to future income replacement rates (from 60% in 2007 to 40% by 2028), a long-term gap remains between contributions made and revenues needed to pay even these much reduced pensions. As currently structured, the trust fund will be exhausted by about 2060, about 15 years later than would have been without the 2007 amendments (Moon, 2009).

One option for dealing with the projected revenues/payments gap would be to further reduce the promised income replacement rate below the 40% level. Alternatively the payroll tax could be increased substantially above its current 9% level to about 24% in the absence of legislative changes between now and 2060, but less if substantial cuts are made sooner (Moon, 2009). It is safe to assume that both of these options would be politically unpopular. A third option would be to add an NDC pillar to the present NPS scheme. This would create individual accounts tied directly to additional contributions made over the years and it would index those accounts to future demographic and economic growth trends as reflected in the “wage sum” or other such measures used to index contributions over the years. This option would call for a politically unpopular payroll tax increase; but by linking it to an additional source of pension income based on notional assets in an individual account, it might be popular or at least less unpopular than other viable other alternatives.

Were a new NDC pillar gradually phased in as part of the South Korean pension scheme, it would help smooth the intergenerational impact of the anticipated increase in the dependency burden associated with population aging. It would call for an increase in the payroll tax; but workers would get a return on their additional contributions, that is, an individual account that would add to pension income at retirement. Also, the indexing mechanisms linked to the NDC model are designed to automatically, but in extreme situations only partially, compensate for economic and demographic changes (Börsch-Supan, 2006; Palmer, 2006).

While the introduction of an NDC pillar would help deal with the problem of long-term sustainability, as noted earlier, this is not the solution to an even more pressing immediate problem South Korea faces, the low rate of coverage and the low level of benefits for current retirees associated with the existing pension schemes (Jung & Walker, 2009). This is an issue for which a social pension is particularly
well suited. The good news is that the 2007 amendments to the National Pension Act created the Basic Old Age Pension scheme, a noncontributory affluence-tested social pension (SSA, 2009). The bad news is that even with this additional pension scheme in place many of those who are old and poor end up excluded from one or more of these old-age security programs and many who are receiving benefits from at least one of them remain far below the poverty line. For household heads aged 60-69 the poverty rate is 25% and for those over age 70 it is 50% (Moon, 2008). What seems to be needed is a plan for raising the level of the Basic Old Age Pension in the years ahead so that seniors who currently fall far below the poverty line move up to, or at least much nearer to, the poverty threshold as soon as possible.

Some consideration is being given to making that pension into a universal pension (Moon, 2008). That may not be the best idea, if the goal is to reduce the number of seniors who fall below the poverty line. It would seem that in the South Korean case it would make more sense to increase the size of the Basic Old Age Pension than to extend the current pension to the relatively affluent. If it turns out that many of those currently being excluded from the Basic Old Age Pension due to the affluence test end up with incomes below the poverty level, then a case could be made to raise the cut point to a level at which this becomes very rare. But if the affluence test is entirely removed, that might lead to lower pension levels for those who are in poverty and most in need of a more generous Basic Old Age Pension.

Would China benefit?

Typically when a country shifts from a mature PAYG-DB scheme to a multi-pillar scheme that includes a substantial FDC pillar, it is difficult for the government to finance the pensions for the currently retired while at the same time diverting a portion of the pension related payroll-taxes into the new funded individual accounts. Because NDC pillars operate on an unfunded PAYG basis, the transition costs can be spread across a broader range of age cohorts (generations) than is possible with the shift to the FDC model (Calvo & Williamson, 2008).

When it comes to implementing multi-pillar schemes that include an FDC pillar, China, with its decentralized pension system, is facing financing problems very similar to those in other countries that have decided to shift from centralized PAYG-DB schemes to multi-pillar schemes that include an FDC pillar. Traditionally the Chinese state owned enterprises (SOEs) were responsible for financing the pensions due their retirees with little or no subsidy from the government. In recent decades, as China has
shifted to a more market driven economy, many of the SOEs have been sharply downsized. This downsizing has in many cases made it all but impossible for employers in many of the older SOEs to contribute what is needed to finance the pensions due their retired former employees. This in turn has led to a pooling of payroll contributions at the city level as well as subsidies drawn from the provincial and in some cases the central government. The FDC accounts were added a few years ago as part of an effort to reduce the dependence of the pension system on the PAYG-DB pillar in the decades ahead.

As noted earlier, in many areas of China payroll-tax contributions by statute designated for individual FDC accounts are being appropriated for use to pay current pensions because other potential sources of funds are not adequate to cover those costs. In contrast, were China to formally shift from an emphasis on the new FDC pillars to the alternative of NDC pillars; that is, to pillars that operate on an unfunded PAYG basis, it would be much easier to finance the burden associated with the introduction of multi-pillar schemes that include individual accounts. This change would help to spread the burden more evenly across a wider range of age cohorts (generations) (Calvo & Williamson, 2008).

China’s relatively immature financial markets could make privately-managed mandatory FDC accounts risky. The current policy of requiring that the accounts be held by government banks does reduce the market risk that would be associated with private sector management of these individual accounts invested in various mixtures of stocks, bonds, and other such securities; but this policy also creates a scheme that has many of the characteristics of a provident fund. Based on the experience of many other countries with provident funds, there is reason to believe that over the long-run the interest paid on assets in these accounts may not keep up with inflation, let alone keep up with increases in wage levels (Impavido, et al., 2009).

That said, the current model does have some potential benefits for the Chinese economy in those regions where these individual accounts are being funded. Many
analysts argue that an FDC pillar will lead to higher levels of national saving, investment, and economic growth (Burtless, 2009; Davis & Hu, 2008), but others emphasize the potentially adverse economic consequences of funded schemes (Matos, 2010; Barr & Diamond, 2008). It is generally agreed that the notional returns on contributions credited to NDC accounts tend to be lower than those in FDC accounts, particularly if the funds in the FDC accounts are invested in well-regulated capital markets, which seems to be the eventual goal in China. But the size of the eventual pension is likely to be much more predictable when based on an NDC account than on an FDC account. In China, at this point in time, an NDC pillar would probably do a better job of safeguarding promised pension benefits than would the current FDC pillar. Furthermore, if contributions were better protected, public confidence in the system would likely increase and workers would be more willing to participate. This might help reduce the prevalence of tax evasion.

Despite the potential advantages of an NDC pillar for urban workers, a multi-pillar scheme that includes an NDC pillar would make less sense for the rural population in China. One reason is that in many remote rural areas the administrative infrastructure needed to keep accurate contribution records over a period of decades does not currently exist. If the schemes were to remain highly decentralized, there would be serious problems linked to finding ways to increment notional assets over the years with confidence that the local government would be able to finance the promised pensions when these workers, largely farmers, retire.

Preliminary reports suggest that about 40% of farmers are electing not to participate in the new program (Shen, 2010). Those from the poorest regions often do not
participate because they cannot afford to make the required contributions. In the more 
affluent rural regions many elect not to participate because the basic pension is set so 
low. Making this point, one farmer we interviewed in Liaoning (a relatively poor area) 
said, “The basic pension benefit is 55 yuan per month while a kilo of pork costs over 30 
yuan.” Another interviewee in Hangzou (a relatively affluent area near Shanghai) 
commented, “The benefit does not help much. It’s too little to live on around here 
when I get old.” Along similar lines, a pension scholar we interviewed in Chengdu 
asserted that, “In this area farmers are generally unwilling to contribute more than 
the required minimum (100 yuan per year) to the funded individual accounts. They 
fear they may never get the money back, due to rapid urbanization and frequent 
changes in pension policy.”

It is unclear how well this new voluntary scheme is going to work out over the 
long run. One concern is that many of the poorest workers may be unable or unwilling to 
contribute to the FDC component, and as a result, those most in need may not benefit. 
One way to deal with this potential problem would be to make the basic pension into a 
social pension with all rural residents over age 60 (or maybe 65) eligible independent of 
whether or not they ever participated in the FDC component. In many rural areas of 
China the administrative structure needed to collect contributions and keep accurate long-
term records of contributions are not yet in place (Shen & Williamson, 2010). It is likely 
that fiscal considerations would make it necessary to set the eligibility age relatively high 
and the size of the pension relatively low, at least at the outset, but the plan could be to 
gradually reduce the age of eligibility and increase the generosity of the pensions at a rate
consistent with the expansion of the Chinese economy in the years ahead (Williamson & Shen, 2006).

Another potential problem is corruption and poor record keeping in connection with FDC schemes in rural areas; past experience has been problematic not only in China, but also in many other countries around the world with relatively low levels of development in rural areas (Johnson & Williamson, 2006). There are options that might make sense for Chinese rural pension policy makers to consider, such as making the FDC component of the scheme optional and not required as a precondition to become eligible for the social pension component. While it is hard to make a compelling argument that the introduction of an NDC pillar as part of a rural scheme would be a good idea, a case can be made that an NDC pillar might be less problematic than the FDC pillar, at least at this point in China’s level of rural development. At least the NDC alternative would protect covered workers from the consequences of turbulent financial markets just prior to retirement.

*Would Singapore benefit?*

The CPF allows participants to withdraw a portion of the funds in the account for certain categories of expenditures such as paying for college education or home ownership. This flexibility is popular and it does have very real benefits, but those benefits come at a cost. The downside is that this flexibility often leads to a substantial reduction in the funds available to live on during retirement. Furthermore, until quite recently there was no requirement that some or all of the funds in the account be used to purchase an annuity that would last until death.

The addition of an NDC pillar could be used to assure that a larger fraction of contributions made to the CPF over the years would be available for annuity income
during retirement. Some of the retirement assets would take the form of virtual credit to be financed on a PAYG basis. Despite the potential benefits, the NDC model is unlikely to become politically acceptable in Singapore any time soon. One reason is the strong institutional and cultural commitment to self-reliance and thus to funded as opposed to PAYG schemes (Loong, 2009). Why take on the fiscal risks associated with unfunded pension schemes when you have a funded scheme that seems to be working? A relevant policy consideration is that many, if not most, workers would not be supportive of a set of reforms that reduced the amount than can be taken out of their CPF accounts over the years to meet important special needs, a practice that has become well institutionalized.

The new CPF LIFE scheme is now mandatory at age 55 for those with SGD 40,000 (USD 29,300) or more in their CPF Retirement Accounts. All funds in accounts of this size or larger are now automatically shifted into the new CPF LIFE accounts. Workers become eligible for a monthly pension for life based on the size of the account when they reach the age of pension eligibility (currently 62 but soon 65). This new scheme will help meet some of the annuity needs that might otherwise have been met with an NDC pillar.

While the introduction of an NDC pillar could be designed in such a way as to help address the increasing problem of pension adequacy in Singapore, it would do relatively little to deal with Singapore’s coverage gap and currently low rates of return. Singapore’s strong cultural emphasis on independence from government welfare and the NDC’s non-redistributive nature suggest that those who cannot meet the Minimum Sum requirement would still be left to rely on the many non-profits (NPOs), such as the Community Development Councils and Voluntary Welfare Organizations currently
operating in Singapore. To address this income adequacy issue, Singapore could consider taking advantage of organizations such as the Community Chest and ComCare and various other non-governmental institutions already in place by subsidizing the equivalent of a social pension, to be administered by these NPOs that currently provide at least some temporary support for the poorest Singaporeans. The limiting nature of NPO administered means-tested pensions would encourage broader independence from the central government and would ensure that only the poorest receive social assistance, without undermining the nongovernmental structures already in place.

Given some of the indexing options currently being used with existing NDC schemes, such a pillar could be used to increase the rate of interest earned on CPF contributions. This could be done in a way that would benefit individual pensioners, but it is unlikely that the Singaporean government would see this as a plus. Currently it uses these funds on many types of projects including those designed to finance development and investments abroad (Hateley & Tan, 2003); paying a higher return on contributions would reduce the funds available for such purposes.

**Conclusion**

Our goal has been to assess the potential utility and feasibility of an NDC pillar as part of future pension reform efforts in each of three East Asian countries (China, South Korea, and Singapore) currently facing rapid population aging and rapid rates of increase in the old age dependency ratio. By combining various elements of PAYG-DB and FDC schemes, NDC pillars attempt to address some of the shortcomings of traditional PAYG-DB pension schemes (South Korea), partially privatized pension systems (China), and provident fund schemes (Singapore).
The analysis that we have presented suggests to us that the introduction of an NDC pillar could be used to help address South Korea’s long-term fiscal sustainability concerns by tying lifetime contributions and eventual pension benefits more closely to one another than is likely under current legislation. By ensuring a relatively flat contribution rate over the long run, the introduction of an NDC pillar in South Korea would help to spread the pension burden linked to projected rapid population aging more evenly across generations.

China could benefit from the introduction of an NDC pillar as an alternative to the “funded” individual accounts currently in place as part of the urban pension scheme, accounts that often go unfunded. It would also be a way to assure that contributions to the individual accounts are indexed to keep up with future increases in wage levels. One concern we have is that the current policy in many provinces of diverting workers’ contributions intended for their funded individual accounts to a different (albeit socially important) use, paying pensions to those who are already retired, will seriously undermine public support for the pension system and contribute to increased tax evasion. Another concern is that when it comes time to retire, it may turn out to be hard for the government to pay what are considered fair (market) rates of return on the payroll tax contributions that are currently being diverted in this way.

The unfunded individual accounts currently in place in many areas in China are in some ways a de facto variant of an NDC pillar, but without a number of the safe guards and benefits of the model as it has evolved in countries such as Sweden (Sundén, 2009). Given the risks associated with funded individual accounts when implemented in countries with relatively immature financial markets, it would seem possible that a
gradual shift from the FDC model to the NDC model would make sense in China, at least at this point in time. However, given China’s rapid rate of economic development, it is possible that funded accounts may make sense in the not too distant future as part of a multi-pillar scheme that also includes an NDC pillar. FDC pillars may have important benefits with respect to fostering economic growth, but they may also be problematic if the primary goal is to assure adequate retirement security for the elderly.

There is reason to be concerned about the future of the new rural pension scheme currently being introduced in China, based as it is on two components, one a social pension component and the other an FDC component. It would make more sense, at least for now, to go with just a universal social pension for the rural population with no FDC component. But if there is to be a contributory individual account component, it would help to make it voluntary and not a precondition for establishing eligibility for the universal social pension component. If it is to continue to be required as a precondition to become eligible for the social pension component, then we would suggest that it be an NDC rather than an FDC pillar or at least that covered workers be given the choice between these two alternatives.

If a well-designed NDC pillar were to be introduced in Singapore, it could offer a way to help deal with the problem of retirement income adequacy. But given the country’s long-term commitment to the provident fund model and minimal government involvement in social welfare issues, it would seem very unlikely that policy makers in Singapore will give serious consideration to the introduction of an NDC pillar. While an NDC pillar would discourage the early withdrawal of savings for other investments and would help guard against inadequate pensions in retirement, this benefit would come at
the cost of the popular benefits associated with the current policy of allowing such withdrawals. Financing college educations can be viewed as an investment in Singapore’s future workforce, while home ownership ensures that more Singaporeans will be free from high rent payments during their retired years (Hateley & Tan, 2003). Furthermore, an NDC pillar would not offer a solution to Singapore’s coverage gap.

Singapore, China, and South Korea all share collectivist cultural legacies. This legacy is particularly strong in the family sphere. With respect to government as opposed to individual (and family) responsibility in providing for old-age security, a very strong emphasis on individual (including the family) responsibility has emerged in Singapore. The government is very reluctant to be defined as responsible for old age security or for the poor more generally. Singapore’s fully funded provident fund scheme fits and supports this value orientation.

How about China and South Korea? The collectivism of the Maoist era extended beyond the family and did deeply involve the government (and the collective farms) in the provision of at least a very modest level of old age security. South Korea did not have this experience and was relatively late in introducing its national pension scheme. One consequences is that its scheme is not yet mature and the fiscal pressure that has led to interest in reforms calling for individual accounts in many other countries is not yet as strong as it will be in a few decades. In both China and South Korea there is an emerging trend toward greater individualism. This may eventually increase popular support for individual accounts, but it is not obvious that these cultural trends will be a major factor in the choice between the FDC and the NDC model.
The NDC model may become both politically and economically viable in China very soon and possibly in South Korea as well a few decades from now. While the introduction of an NDC pillar as part of Singapore’s CPF could have real benefits, we do not expect to see an NDC pillar introduced in Singapore in the foreseeable future, given the current pension system which firmly embodies individualistic social security values. While our focus has been on China, South Korea, and Singapore, we would argue that there are obvious lessons from our analysis for policy makers in other nations as well, particularly other industrializing nations experiencing rapid population aging.

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Table 1 Trends and Projections: Population Aging and Old-Age Dependency, 1960-2030.

<table>
<thead>
<tr>
<th>Region</th>
<th>1960 Percentage of population 65+</th>
<th>2004 Percentage of population 65+</th>
<th>2030 Percentage of population 65+</th>
<th>1960 Old-age dependency ratio</th>
<th>2004 Old-age dependency ratio</th>
<th>2030 Old-age dependency ratio</th>
</tr>
</thead>
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<tr>
<td>OECDa Countries</td>
<td>9.4</td>
<td>15.0</td>
<td>22.7</td>
<td>0.15</td>
<td>0.22</td>
<td>0.37</td>
</tr>
<tr>
<td>Non-OECD Countries</td>
<td>4.2</td>
<td>6.1</td>
<td>10.9</td>
<td>0.08</td>
<td>0.10</td>
<td>0.17</td>
</tr>
<tr>
<td>Non-OECD East &amp; South East Asiab</td>
<td>3.3</td>
<td>5.6</td>
<td>13.2</td>
<td>0.06</td>
<td>0.08</td>
<td>0.20</td>
</tr>
<tr>
<td>Singapore</td>
<td>2.1</td>
<td>8.2</td>
<td>24.4</td>
<td>0.04</td>
<td>0.12</td>
<td>0.38</td>
</tr>
<tr>
<td>South Korea</td>
<td>3.3</td>
<td>9.0</td>
<td>23.9</td>
<td>0.06</td>
<td>0.13</td>
<td>0.37</td>
</tr>
<tr>
<td>China</td>
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<td>7.5</td>
<td>16.4</td>
<td>0.09</td>
<td>0.11</td>
<td>0.25</td>
</tr>
</tbody>
</table>


* Included in the OECD category are those countries that signed the OECD Convention between 1960 and 1973. All future members, including South Korea, are categorized as Non-OECD.

* This sample includes 18 East Asian and South East Asian countries.