3. Chapter Three

Economic Freedom and Pensions

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Because of aging populations and falling birth rates, public pensions are an increasingly important policy issue. Most governments have some type of tax-and-transfer system, with payments to the elderly being financed by levies on workers. Such systems are mathematically feasible when there are lots of young people and relatively few retirees. But increasing lifespans and falling birthrates have changed that equation. As a result, many nations will soon face significant fiscal imbalances. Simply stated, current rates will not generate nearly enough revenue in the future to finance promised benefits.

Countries that figure out the best way of navigating this challenge will enjoy better economic outcomes compared to nations that either make bad policy choices or "kick the can down the road" and allow problems to fester.

This chapter will analyze Social Security/pension-related systems, consider the costs and benefits of various policy options, and conclude by investigating the challenges of incorporating pension systems into the index published in the *Economic Freedom of the World*.

Why Pension Policy Is Important

Most governments have pay-as-you-go (PAYG) pension systems, which means that benefits paid each year are financed by taxes collected each year. Moreover, they generally impose payroll taxes (social insurance taxes) created expressly for the purpose of financing pensions (along with programs such as healthcare and unemployment insurance).

Such systems were created at a time when it was assumed that there would be ever-growing cohorts of young people to enter the workforce and support each new group of retirees.

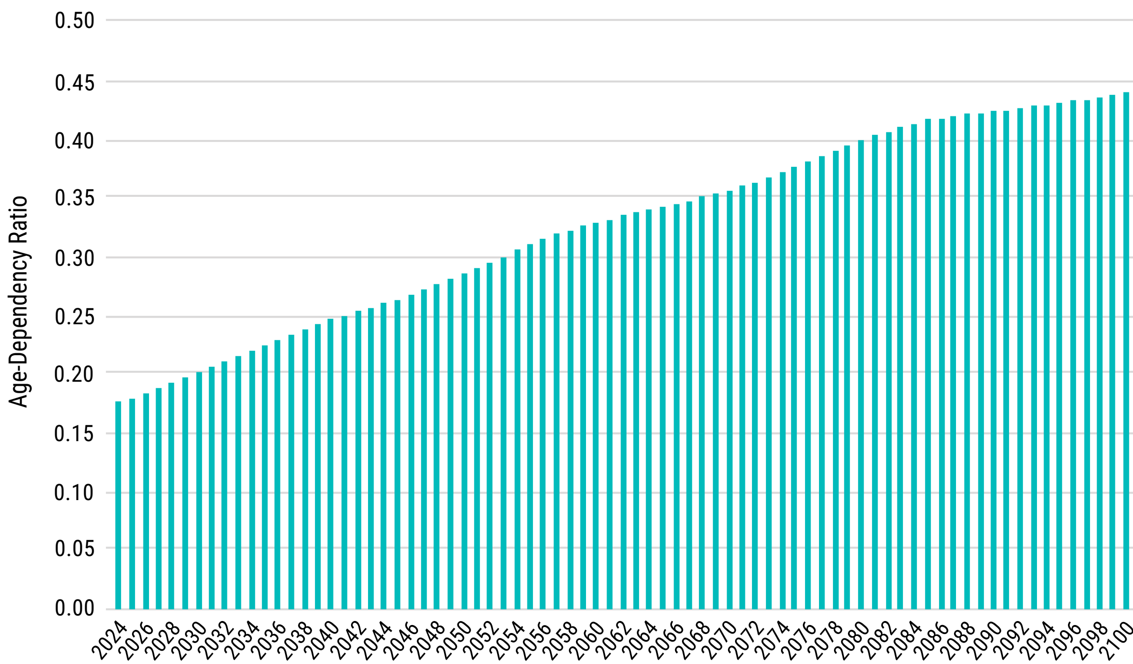
At the risk of understatement, that population profile no longer exists. At least not in any developed nation except Israel. And when looking at pensions, demography is destiny. In 1960, for instance, there were 5.1 US workers for every Social Security

recipient. By 1990, there were only 3.4 workers per beneficiary. Today, there are only 2.7 workers paying into the system for every recipient (SSA-OCA, 2024).

The situation is even worse in other nations. One way to see this is to look at the old-age dependency ratio. It is the number of people aged 65-and-older relative to the number of people aged 15 to 64. Japan's old-age dependency ratio is nearly twice as large as that of the United States. And Italy is about halfway between Japan and the United States (Our World in Data, 2024).

The future outlook is even worse. According to the United Nations, the world's old-age dependency ratio will nearly triple over the next 75 years. Within 50 years, the world average will be roughly equal to Italy today (UN DESA-PD, 2024).

Figure 3.1: World's Age-Dependency Ratio Will Nearly Triple Over Next 75 Years

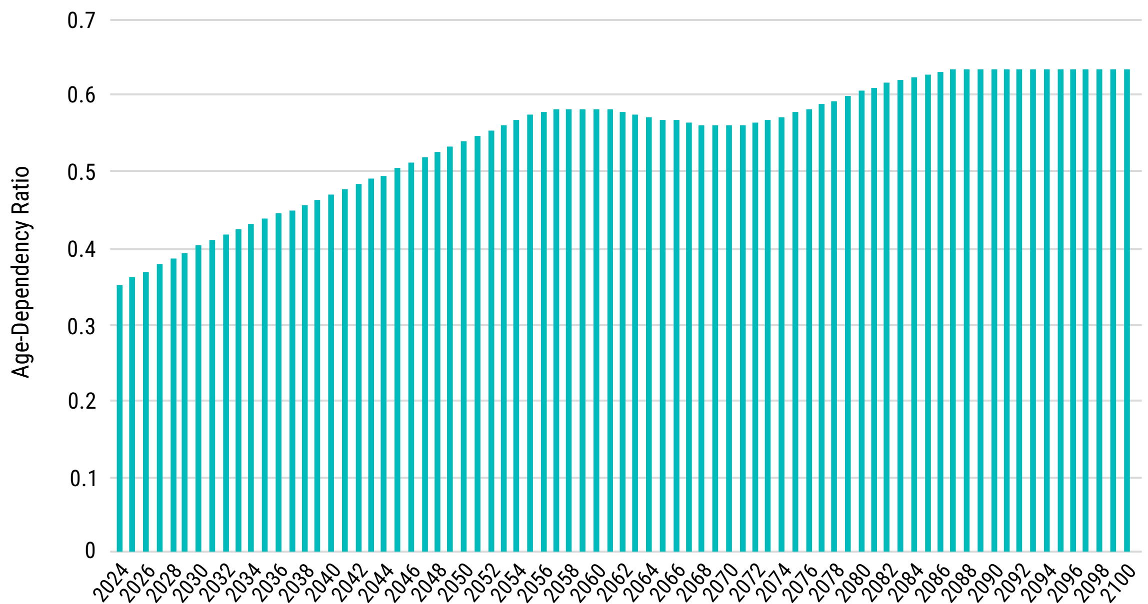


Source: UN DESA-PD, 2024.

Some countries will have unthinkable population shifts. The old-age dependency ratio will skyrocket in China, jumping from 23 today to more than 106 by the year 2100. Japan will go from 0.55 to 0.80, Canada will go from 0.33 to 0.59, and the United States will go from 0.31 to more than 0.54.

Looking at regions, Europe faces an enormous challenge. The old-age dependency ratio is already worrisome today, with one old person for every three working-age people. By 2045, there will only be two workers for every person over age 65. And the numbers will continue to worsen for the rest of the century.

Figure 3.2: Europe's Age-Dependency Ratio Will Double Over Next 75 Years



Source: UN DESA-PD, 2024.

This is not merely an issue of demographic change. That is merely the action-forcing event. What really matters is that changing population dynamics have enormous fiscal implications. For nations with tax-and-transfer systems, the combination of more old people and fewer workers means that spending burdens will increase at the same time that tax bases are shrinking. This unavoidably will lead to some combination of the following.

- Large debt increases—Even though most governments already have large debt burdens, politicians will be tempted to borrow massive amounts of money to provide benefits to a key voting bloc.
- Large tax increases—Tax burdens are at or near record highs in most nations, but there will be a lot of pressure on politicians to increase various taxes in hopes of propping up pension systems.
- Reckless monetary policy—Governments that cannot finance spending with taxes or borrowing may be tempted to lean on their central banks to monetize new debt as a financing mechanism.
- Large benefit cuts—To the extent that financial markets are unwilling to lend governments more money and to the extent that governments already have imposed maximum-possible tax burdens (Trabandt and Uhlig, 2010), significant benefits cuts will be likely.

- Systemic reform—As will be discussed in this chapter, politicians have the option of shifting to retirement systems based on private savings. This will solve long-run fiscal and demographic problems but probably have a significant "transition cost."[1]

In many cases, policy makers in various governments will rely on a combination of the aforementioned options.

Funded Retirement Systems

The alternative to a "pay-as-you-go" pension system is a "funded" system. Under this approach, workers are required to put money into retirement accounts instead of being forced to pay taxes to fund current government benefits. The money in private accounts is then invested, with all earnings automatically reinvested. Over a working lifetime, thanks to the power of compound interest (what Einstein allegedly called the "most powerful force in the universe" [Mikkelson, 2006]), workers accumulate substantial nest eggs. Those funds then can be used to provide income during retirement.

Unlike pay-as-you-go systems, funded systems are immune to demographic change. Retirement income for the elderly is not dependent on whether there are lots of young workers. All that matters is whether funded systems are well designed so that private saving today translates into sufficient retirement income tomorrow.

There are many nations that already have systems that require workers to invest money for retirement. Some of these systems are designed to provide the bulk of retirement income. Examples include Australia, Iceland, Denmark, Netherlands, Chile, and Switzerland. Other funded systems are designed to augment government pay-as-you-go programs. Examples include Sweden, Israel, Estonia, and South Korea.[2]

Should There Be a Mandatory System of any Kind: The Freedom-Prudence Tradeoff

If the goal is to maximize the economic freedom of individuals, then there should not be any mandatory retirement system, whether based on private savings or govern-

1 If lawmakers allow younger workers to divert their payroll taxes to personal retirement accounts, they will need to find another way of financing benefits to current retirees (as well as older workers who would not have enough time to fully benefit from a reformed system).

2 See Mitchell and O'Quinn (forthcoming).

ment entitlements. Individuals would have the freedom to decide how long to work, how much money to save, and what to do with their savings.

This used to be the norm. The first mandatory pay-as-you-go system was created in Germany in 1889 (SSA, n.d.). Other developed nations followed, including Canada in 1927 and the United States in 1935 (Guest, 2006). Before those developments, almost all people were responsible for their own retirement. This meant they voluntarily saved money during their working years or relied on support from their children. Or they never retired.

This sounds appealing to people who dislike government coercion, but it may not be politically sustainable. The majority of voters and policy makers may assume that workers are too short-sighted to set aside enough money. If this assumption is widespread, the relevant choice may be whether to have a mandatory pay-as-you-go system or a mandatory funded system.

If those are the only two options, a mandatory funded system has enormous advantages over government-run, pay-as-you-go systems. Workers would benefit from compound interest, they would be protected from demographic decay, and they would rely on their own real assets instead of having to depend on promises from politicians.

Level of Mandated Savings

If policymakers decide to have mandatory personal accounts as part of a funded system, the next decision is the level of required savings. And that requires answers to several questions.

- Is the goal to make sure retirees don't live in poverty?
- Or is the goal to replace a percentage of pre-retirement income?
- What are the assumed rates of return for private accounts?
- How long will people be employed before they retire?

Depending on how these questions are answered, the required savings rate might be as low as five percent. Especially if the goal is merely to avoid poverty and people do not retire until age 70.

As a general rule, though, retirement experts believe workers should save at least 10 percent of their income.

Defined Contribution vs Defined Benefit

Another design issue is whether to have "defined contribution" accounts or "defined benefit" accounts, sometimes referred to as DC or DB plans. With a DB plan, a fund administrator commits to provide a specific income stream upon retirement. With a DC system, workers build a nest egg and then decide how to access their funds after retiring. Here's a comparative table put together by a financial services company.[3]

Table 3.1: Defined Benefit vs. Defined Contribution Systems

	Defined Benefit	Defined Contribution
Contributions	The employee's contributions are set, while the employer must fund the amount necessary to meet future obligations.	Both the employees and the employer contribute an established amount
Future Value is Based on	A pre-established formula (usually based on length of employment and highest earning years)	The investment value of the employer and employee contributions
Changes in Salary Affect	The entire pay out value (as it is usually based on your top earning years)	Only the amount of future contributions
Investment Risk	Resides with the employer	Resides with the employee
Amount paid out when changing jobs is equal to	An actuarial present value of the amount that would have been received in the future based on a pre-established formula.	The total of your contributions and the employers vested contributions
Duration of Pension Income	Indefinite	Until the value of the invested contributions are eroded
Risk for you	The employer not being able to meet its future pension obligations	Not being able to receive enough future income from the invested amount

Source: Astrolabe Financial Media, 2014.

To elaborate, here is how the U.S. Department of Labor defines the two approaches.

- "A defined benefit plan promises a specified monthly benefit at retirement. The plan may state this promised benefit as an exact dollar amount, such as $100 per month at retirement. Or, more commonly, it may calculate a benefit through a plan formula that considers such factors as salary and service." (U.S. Department of Labor, n.d.)
- "A defined contribution plan… does not promise a specific amount of benefits at retirement.… the employee or the employer (or both) contribute to the employee's individual account…, sometimes at a set rate, such as 5 percent of earnings annually. These

3 http://astrolabefinancial.ca/new-blog/2014/4/24/understanding-your-pension-defined-contribution-the-new-norm

> contributions generally are invested on the employee's behalf. The employee will ultimately receive the balance in their account... The value of the account will fluctuate due to the changes in the value of the investments." (U.S. Department of Labor, n.d.)

The main advantage of a DB plan is certainty. Workers know exactly how much income they will receive when they retire. Assuming, of course, that the plan has sufficient funds, which has been a big problem for some US-based DB pension funds.

The main advantage of a DC plan is that there is more control and lower administrative costs. Moreover, a DC plan gives retirees the possibility of leaving part of their nest egg to their children or other heirs.

Almost all countries with funded pension systems have DC plans. Moreover, one of the nations with a DB plan, the Netherlands, is shifting to a DC plan.

Who Invests, and for Whom?

If there is a system of personal retirement accounts, there are three broad options for investment governance.

- Let individuals determine how their retirement savings are invested.
- Require professional management of how retirement funds are invested.
- Put the government in charge of investing retirement funds.

As a practical matter, the first two options often blur together. Most pension systems have professional fund managers, but workers often have considerable ability to steer funds to certain types of investments.

The third option is government-run investment, which is the approach used in Singapore as well as pension funds for government bureaucrats in many jurisdictions. The relevant concern is whether politicians can resist the temptation to dictate how monies are invested. Workers will enjoy the best outcomes if fund managers are guided by a fiduciary responsibility to maximize returns. But if politicians are directly or indirectly interfering with investment choices, retirees will ultimately have less income. Moreover, a system with government-dictated investment further restricts the freedom of individuals. They will be forced to save, and they will not even get to directly or indirectly control how their money is invested.

As a practical matter, governments can indirectly control how private pension plans invest funds. They can require private pension funds to buy government bonds.

They can prohibit them from investing overseas. They can impose "ESG" requirements that force funds to make sub-par investments for political reasons (Globerman, 2024).

One final observation is that there usually are no investments with pay-as-you-go systems. Benefits paid each year are financed by taxes collected each year. However, there are a few governments that have sovereign wealth funds that invest money in private markets for the purpose of accumulating assets that can be used to pay future retirement benefits. Examples of countries with partial funding of government systems include Canada, Ireland, Finland, Japan, South Korea, Luxembourg, Portugal, Switzerland, Norway, and Italy.

How Do Workers Access their Savings Upon Retirement?

With a DB system, workers automatically get a specific amount of money. With DC systems, however, policy makers must decide what happens with nest eggs upon retirement. There are several options.

- No rules, which is the most laissez-faire approach, though it does lead to the worry that people will spend their retirement savings too quickly.
- Mandatory annuitization, which means new retirees use their nest egg to buy a future income stream. This is akin to turning a DC account into a DB payout.
- Phased withdrawals, which limit how much money retirees can access each year, perhaps adjusted by age and the size of nest eggs.

Lawmakers also should consider how policies governing withdrawals interact with safety-net programs. If such programs are too generous, that may give retirees an incentive to quickly spend (or give away) their assets.

Another important issue is whether workers can access their accounts for expenses before retirement. If that is the case, it defeats the purpose of workers building large nest eggs.

How to Incorporate Pensions into the EFW

Pension policy is vitally important for national prosperity and economic freedom. This is especially important since most nations face demographic decline. Adding a pension-specific measure would enhance the value of *Economic Freedom of the World*. But it would not be easy. There would be two challenges:

1. Developing an objective standard by which different pension designs affect economic freedom, and
2. Finding sufficient data to score countries.

With regard to the first question, economic freedom is maximized when there is no pension policy. In other words, individuals will enjoy the most economic freedom when they are free to make their own choices about how long to work, how much to save, and what to do with their savings. Nations following that approach would receive the highest score. That might mean under-developed countries that lack the capacity to operate a functional pension system will earn the top scores in this component (just as some very poor countries lack the capacity to redistribute much money and therefore get good score for size of government).

Here is a look at how various approaches would rank, from the lowest-scoring option on the left and the highest-scoring option on the right.

Table 3.2: Pension Plans and Economic Freedom

Government-managed, PAYG, defined-benefit plans	Government-managed, PAYG, notional defined-contribution accounts	Government-managed, partially funded, defined-benefit or notional defined contribution plans	Government-managed, fully funded, defined-benefit plans	Government-managed, fully funded, defined contribution plans	Mandatory, privately managed, fully funded, defined contribution plans	Laissez-faire

Source: Author's calculations.

As discussed earlier in this chapter, a pure laissez-faire approach is the policy that maximizes economic freedom and thus would merit a perfect score. However, it seems that no nation is in this category. From a practical perspective, this means constructing a scoring system is an exercise in ranking options that range from second best to terrible. On this basis, the default option for the best score would then go to nations with retirement systems based on mandatory private savings.

But there are many secondary questions that have to be answered. Here are some possible choices, though many of them could be characterized as paternalistic.

- A better score for nations that have systems where the private sector will generate the highest shares of retirement income.

- A better score for nations that allow private management of investment rather than government control.
- A better score for nations that choose defined contribution accounts rather than defined benefit accounts.
- A worse score for nations that require annuitization or phased withdrawals to ensure adequacy in old age.

Unfortunately, the data options for scoring pension policy are limited. The International Monetary Fund has extensive macroeconomic and microeconomic data for nations around the world.[4] But there is not enough detail about pension systems to allow proper rankings. The World Bank has produced very good research on pension issues (World Bank, 1994), but it also doesn't have sufficiently detailed databases. The Organisation for Economic Co-operation and Development (2023) has detailed databases, but largely limited to member states. The same is true about the European Commission (Directorate-General for Economic and Financial Affairs, 2024). There are also very thorough private-sector analyses, but they only focus on major nations (Mercer, 2023).

The Social Security Administration in the United States used to publish comprehensive reports covering many nations, but has discontinued that project (SSA-ORDP-ORES, 2019). But it does still publish updates that are relatively rich sources of information (SSA-ORDP, 2024). Taking those periodic updates and combining them with the sometimes out-of-date information from the International Social Security Administration (somewhat detailed data on the pension systems of nearly 190 jurisdictions [ISSA, n.d.]) should give researchers enough information to rank nations.

Here are the major variables that should be used when ranking nations, along with commentary of whether such data actually exists.

- **Government-run PAYG system – Widely available**
  - Payroll tax rate – Widely available
  - Government pension outlays as share of GDP – Limited data
  - Is payroll tax income capped – Generally available

4 The IMF's World Economic Outlook Database (2024) has extensive macroeconomic data (available at https://www.imf.org/en/Publications/WEO/Issues/2024/04/16/world-economic-outlook-april-2024), while Article IV country reports have extensive microeconomic data (available at IMF Search Hub https://www.imf.org/en/Search#q=%22imf%20staff%20country%20reports%22&sort=relevancy&f:type=[PUBS,COUNTRYREPS,ARTICLE4]).

    - Sovereign wealth fund – Generally available
    - Notional DC plan – Generally available
- **Mandatory system of private savings – Widely available**
    - Mandatory savings rate – Widely available
    - DC or DB plan – Generally available
    - Government-run or government-dictated investment – Somewhat available
    - Government-dictated withdrawals – Somewhat available

One additional complication is that most countries have special regimes for different types of workers, so judgements have to be made about how to classify countries. Also, many nations have hybrid systems, meaning that they rely on both government PAYG systems and mandatory private savings. And other nations are in a transition phase with relatively new systems of mandatory private savings, which means most retirees are getting government benefits based on PAYG systems.

Last but not least, there is the issue of how to incorporate a pension rating with other variables in *Economic Freedom of the World*. Presumably it would be a component measure used to calculate a score for the Size of Government. That being said, if pension spending and/or the payroll tax rate are included in the pension score, it would be important to adjust other fiscal components to avoid double-counting.

Sample Scoring Method

Here is a sample grading for a representative group of countries, based on the following methodology.

10.0 – Total individual choice

8.5 – Large funded DC accounts

7.5 – Funded DB plans…or small funded DC accounts

5.0 – Funded provident accounts

2.5 – Partially funded government-run system…or…notional definedcontribution PAYG system

0 – PAYG DB system

Since some nations have blended or hybrid systems, one possible solution is to score their government plans, score their private plans, and then average the two scores.

Country	Scores
Hong Kong	**10.0**
Australia	**9.3**
Chile	**9.0**
Netherlands	**8.8**
Singapore	**8.0**
Taiwan	**7.3**
Switzerland	**6.3**
Mexico	**5.8**
Sweden	**5.8**
Germany	**5.7**
Estonia	**4.8**
New Zealand	**4.3**
Canada	**3.3**
South Africa	**3.3**
United States	**2.8**
Italy	**2.5**
France	**1.8**
Argentina	**1.3**
Russia	**1.3**
United Kingdom	**1.2**

Source: Author's calculations

Conclusion

Social welfare spending has become a considerable problem in many nations, with pension expenditures usually being the biggest reason for excessive fiscal burdens. Due to increasing lifespans and falling birthrates, the fiscal costs of pay-as-you-go pension systems will become an even bigger problem in the future. But demographics is not destiny. Some jurisdictions have adopted different ways of providing retirement income security. Most notably, a significant number of nations have systems based on compulsory private savings, while others have experimented with reforms ranging from notional-defined contribution accounts to government reserve funds. This chapter provides a framework for assessing pension systems and shows a potential way of scoring a sample of nations.

Appendix: Types of Pensions

1. **Government-managed, PAYG, defined-benefit plans.** This is the stereotypical system operated by most governments. The government runs the system. Benefits paid each year are financed by taxes collected each year (pay-as-you-go, or PAYG), and retirees are given a specific amount of money based on either their earnings histories or the level of their income. Most of these systems have some level of redistribution that results in upper-income workers getting a worse deal than lower-income workers.

2. **Government-managed, PAYG, notional defined-contribution accounts.** In an effort to deal with demographic change, nations such as Sweden and Italy have shifted in whole or part from defined-benefit PAYG systems to defined-contribution PAYG systems. But since no funds are actually invested in private assets, they are "notional" defined-contribution accounts. But they work the same way as real defined-contribution accounts in that future benefits are tied to taxes paid. This approach reduces or even eliminates redistribution within the pension system and puts a cap on the level of benefits.

3. **Government-managed, partially funded, defined-benefit or notional defined contribution plans.** Some nations do not have personal retirement accounts for individual workers, but instead have government funds (sometimes known as sovereign wealth funds) that are designed to accumulate assets that can then be liquidated to help finance future retirement benefits.

4. **Government-managed, fully funded, defined-benefit plans.** Some countries have retirement systems based on employer-provided pensions. Under this approach, private fund managers privately invest the savings of workers and commit to provide specific payments to those workers upon retirement. To work effectively, this system needs to avoid the problem of under-funding and bankruptcy, which has plagued some US-based defined benefit plans.

5. **Government-managed, fully funded, defined-contribution plans.** A few countries such as Singapore have systems of private retirement savings, but the government is the custodian of the money. To work well, this type of system requires very honest governance and a commitment to invest on the basis of what is good for workers rather than what is in the best interest of politicians.

6. **Mandatory, privately managed, fully funded, defined-contribution plans.** This is the stereotypical "privatized" system. Workers are obligated to set aside a certain amount of money each pay period, with private fund managers then investing the money (and reinvesting all returns) so that workers have a large "nest egg" of accumulated

assets when they retire. Government still plays a role since it mandates the savings, sets the rules that determine qualified fund managers, and also has authority over when and how workers can access their money during retirement.

7. **Laissez faire.** This is the "hands-off" approach where government lets people decide how or even if they will save for retirement. This is what used to exist all over the world prior to Bismarck creating a retirement system for Germany in 1889. It appears that the last developed jurisdiction to use that approach was Hong Kong, which only adopted a universal government program in the 1970s (and has since created a system of personal retirement accounts).

Table A.1: National Pensions Systems

		Government PAYG Systems										
Countries	**Laissez-Faire**	**Combined Employee-Employer Payroll Tax Rate**	*Sub-Component 1.i*	**Uncapped Payroll Tax**	*Sub-Component 1.ii*	**Public Pension Spending as Share of GDP**	*Sub-Component 1.iii*	**Notional Defined Contribution**	*Sub-Component 1.iv*	**Partial Funding of PAYG Systems**	*Sub-Component 1.v*	**Score**
Argentina	No	23.5%	0	Partly	5							2.5
Australia	No	General Revenue			10	5.4%	7					8.5
Canada	No	11.9%	2	No	10	5.0%	7			Yes	7	6.5
Chile	No	0.0%	10		10	2.9%	9					9.5
Estonia	No	16.0%	1	Yes	0	6.7%	7					2.7
France	No	15.5%	1	No	10	13.9%	0					3.7
Germany	No	18.6%	1	No	10	10.4%	1					11.3
Hong Kong	No	General Revenue	10		10							10
Italy	No	33.0%	0	No	10	16.0%	0	Yes	8	Yes	7	5
Mexico	No	General Revenue		Yes	0	3.1%	9					4.5
Netherlands	No	0.0%	10		10	5.9%	7					9
New Zealand	No	General Revenue			10	5.0%	7					8.5
Russia	No	22.0%	0	Partly	5							2.5
Singapore	No	0.0%	10	No	10							10
South Africa	No	2.0%	3	No	10							6.5
Sweden	No	14.7%	2	No	10	9.3%	2	Yes	8			5.5
Switzerland	No	12.0%	2	Yes	0	6.7%	7			Yes	7	4
Taiwan	No	5.1%	3	No	10							6.5
United Kingdom	No	27.8%	0	Yes	0	5.7%	7					2.3
United States	No	12.2%	2	No	10	7.1%	5					5.7

Source: Author's calculations

Table A.1: National Pensions Systems (cont'd)

		Mandatory Private Savings Plans									
Countries	Laissez-Faire	Mandatory Private Defined Contribution Accounts	Sub-Component 2.i	Mandatory Private Defined Benefit Accounts	Sub-Component 2.ii	Government-Dictated Investment	Sub-Component 2.iii	Mandatory Annuitization-Phased Withdrawals	Sub-Component 2.iv	Component 2	Total Score
Argentina	No									0	**1.25**
Australia	No	11.5%	10							10	**9.25**
Canada	No									0	**3.25**
Chile	No	10.0%	10					Yes	5	8.5	**9.00**
Estonia	No	6.0%	8					Yes	5	7	**4.83**
France	No									0	**1.83**
Germany	No									0	**5.67**
Hong Kong	No	10.0%	10							10	**10.00**
Italy	No									0	**2.50**
Mexico	No	6.3%	8					Yes	5	7	**5.75**
Netherlands	No			17.9%	10			Yes	5	8.5	**8.75**
New Zealand	No									0	**4.25**
Russia	No									0	**1.25**
Singapore	No	11.5%	10			Yes	0			6	**8.00**
South Africa	No									0	**3.25**
Sweden	No	2.5%	6					Yes	5	6	**5.75**
Switzerland	No			7%–18%	10			Yes	5	8.5	**6.25**
Taiwan	No	6.0%	8							8	**7.25**
United Kingdom	No									0	**1.17**
United States	No									0	**2.83**

Source: Author's calculations

REFERENCES

Astrolabe Financial Media (2014). *Understanding Your Pension: Defined Contribution the New Norm?* Astrolabe Financial Group Inc. (April 24). <http://astrolabefinancial.ca/new-blog/2014/4/24/understanding-your-pension-defined-contribution-the-new-norm>, as of September 17, 2024.

Directorate-General for Economic and Financial Affairs (2024). *2024 Ageing Report. Economic and Budgetary Projections for the EU Member States (2022–2070).* European Commission. <https://economy-finance.ec.europa.eu/publications/2024-ageing-report-economic-and-budgetary-projections-eu-member-states-2022-2070_en>, as of September 17, 2024.

Globerman, Steven (2024). *It's Time to Move on from ESG*. ESG: Myths and Realities. Fraser Institute. <https://www.fraserinstitute.org/studies/its-time-to-move-on-from-esg-esg-myths-and-realities>, as of September 17, 2024.

Guest, Dennis (2024). Social Security. In *The Canadian Encyclopedia*. <https://www.thecanadianencyclopedia.ca/en/article/social-security>, as of September 17, 2024.

International Monetary Fund (2024). *World Economic Outlook—Steady but Slow: Resilience amid Divergence*. International Monetary Fund. <https://www.imf.org/en/Publications/WEO/Issues/2024/04/16/world-economic-outlook-april-2024>, as of September 17, 2024.

International Social Security Association [ISSA] (n.d.). *Social Security Around the World: Country Profiles*. International Social Security Association. <https://www.issa.int/databases/country-profiles>, as of September 17, 2024.

Mercer (2023). *Mercer CFA Institute Global Pension Index 2023*. Mercer. <https://www.mercer.com/insights/investments/market-outlook-and-trends/mercer-cfa-global-pension-index/>, as of September 17, 2024.

Mikkelson, David (2006). *Einstein and Compound Interest*. Snopes (November 6). <https://www.snopes.com//fact-check/compound-interest/>, as of September 17, 2024.

Mitchell, Daniel, and Robert O'Quinn (forthcoming*). Retirement Income Systems in OECD Member States.* Fraser Institute.

Organisation for Economic Co-operation and Development [OECD] (2023). *Pensions at a Glance 2023: OECD and G20 Indicators*. OECD Publishing. <https://www.oecd.org/en/publications/2023/12/pensions-at-a-glance-2023_4757bf20.html>, as of September 17, 2024.

Our World in Data (2024). Old-Age Dependency Ratio [Chart]. UN World Population Prospects (2024)—processed by Our World in Data. <https://ourworldindata.org/grapher/age-dependency-ratio-old?tab=chart&country=JPN~OWID_WRL~ITA~USA>, as of September 17, 2024.

Social Security Administration [SSA] (n.d). *Social Security History: Otto von Bismarck*. Government of the United States. <https://www.ssa.gov/history/ottob.html>, as of September 17, 2024.

Social Security Administration, Office of the Chief Actuary [SSA-OCA] (2024). Covered Workers and Beneficiaries—2024 OASDI Trustees Report [Table]. <https://www.ssa.gov/oact/TR/2024/lr4b3.html>, as of September 17, 2024.

Social Security Administration, Office of Retirement and Disability Policy [SSA-ORDP] (2024). *International Update* (August). <https://www.ssa.gov/policy/docs/progdesc/intl_update/index.html>, as of September 17, 2024.

Social Security Administration, Office of Retirement and Disability Policy, Office of Research, Evaluation, and Statistics [SSA-ORDP-ORES] (2019). *Social Security Programs Throughout the World* (various countries). <https://www.ssa.gov/policy/docs/progdesc/ssptw/>, as of September 17, 2024.

Trabandt, Mathias, and Harald Uhlig (2010). *How Far Are We from the Slippery Slope? The Laffer Curve Revisited*. Working Paper Series 1174. European Central Bank.

United Nations, Department of Economic and Social Affairs, Population Division, [UN DESA-PD] (2024). *World Population Prospects 2024, Online Edition*. United Nations. <https://population.un.org/wpp/Download/Standard/MostUsed/>, as of September 16, 2024.

U.S. Department of Labor (n.d.). *Types of Retirement Plans*. U.S. Department of Labor. <https://www.dol.gov/general/topic/retirement/typesofplans>, as of September 16, 2024.

World Bank (1994). *Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth*. World Bank Group. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/973571468174557899/Averting-the-old-age-crisis-policies-to-protect-the-old-and-promote-growth>, as of September 17, 2024.