NDC and Points Systems: Are They Really So Different?

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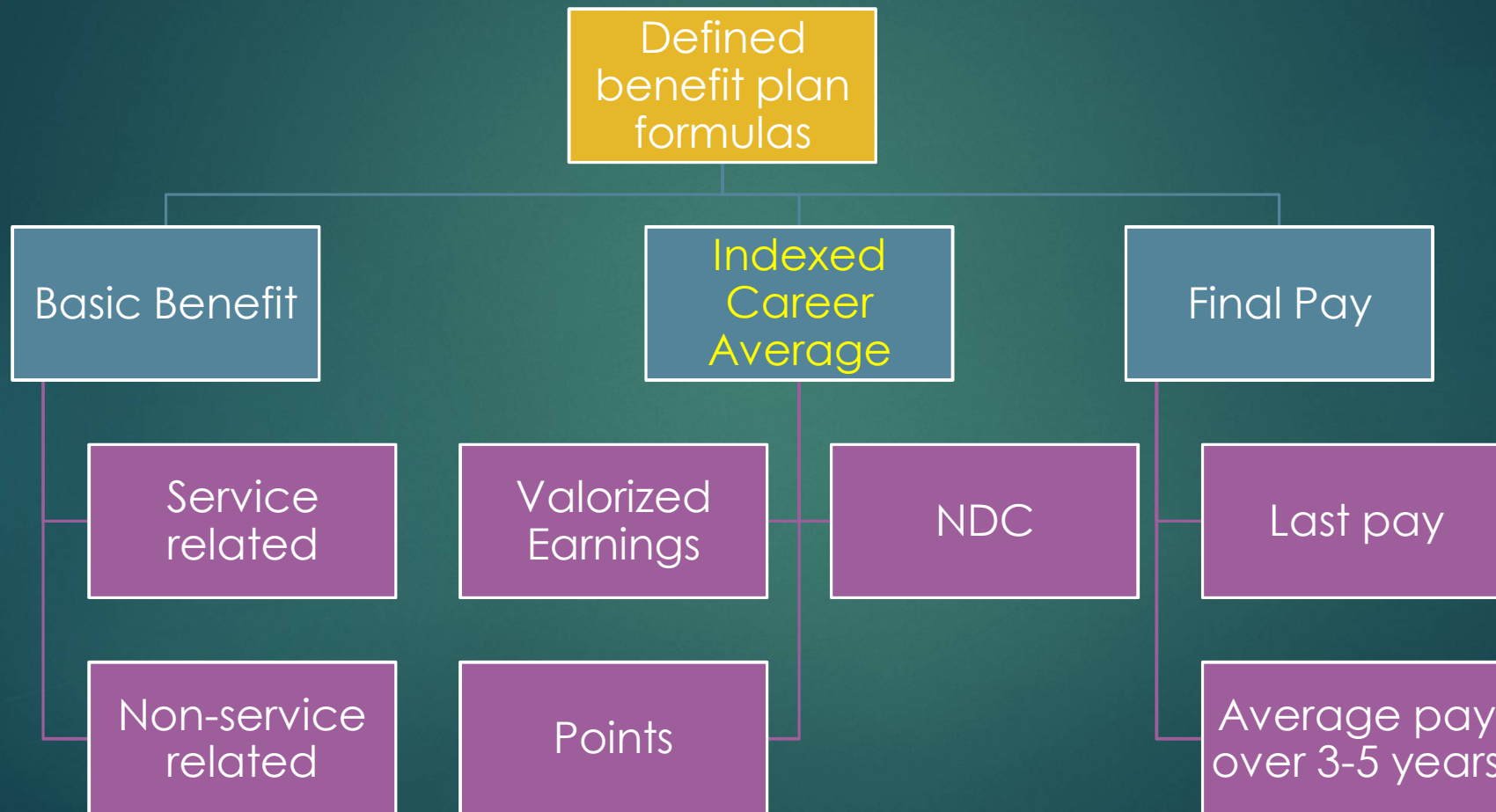
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OCTOBER 24, 2019

Agenda

► Defined Benefit Pension Plan Formulas Classification

► Indexed Career Average Formulas

   ► Valorized earnings

   ► NDC

   ► Points

► Similarities and differences between valorized earnings, NDC and Points

Defined Benefit Plan Formulas

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                    Defined
                    benefit plan
                    formulas

   Basic Benefit        Indexed              Final Pay
                        Career
                        Average

   Service          Valorized      NDC        Last pay
   related          Earnings

   Non-service      Points                    Average pay
   related                                     over 3-5 years
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Indexed Career Average Plans

- Average pay is calculated across the worker's entire career or over very long time period (30 or more years)

- Pay from past years is "indexed" or "valorized" to account for the change in its value from the year earned to the year of retirement

- Valorization factor is usually related to one of the following:

  - Changes in average wage

  - Changes in wage fund or contribution revenue

  - Inflation

  - Economic (GDP) growth

  - Capital market rates of return

Indexed Career Average Plans

- ▶ All designed to encourage payment of correct contributions based on correct salary in each and every year

- ▶ All designed to link benefit to wages (or the contributions based on those wages). Those who pay more, get more

- ▶ One or more of the key factors in the benefit calculation – average wages, accrual rate, years of service and actuarial adjustments – may be "hidden" in the formula

Valorized Earnings

▶ List actual pensionable earnings for each calendar year, taking into account any wage ceilings

▶ Typically valorize each year's earnings by multiplying by average wage in year of retirement and dividing by average wage in year in which the salary was earned. Could use another valorization method

▶ Average the valorized earnings

▶ Multiply average valorized earnings by accrual rate and by years of service to calculate pension benefit

▶ Pension benefit indexed following retirement. Indexing method may differ from valorization method

NDC

- Contribution rate considered fixed; benefits "automatically" adjusted downward to keep plan in fiscal balance

- "Contributions" to NDC account equals wage times contribution rate and is credited to hypothetical account

- Amount in account "valorized" each year until retirement

- Amount in account at retirement divided by a "conversion factor" to convert account balance to a monthly pension benefit

- Conversion Factor generally a function of life expectancy at retirement, varies by retirement age and is adjusted annually

- NDC account valorization method may or may not be used for post-retirement indexing

Points

- Benefit is a function of number of points earned during working career and point value in year of retirement

- Number of points earned each year is typically related to individual's wage compared to national average wage

- Accumulate points over working career

- Point value typically related to desired replacement rate per year of service for average wage worker

- Point value valorized each year

- Point value valorization method may or may not be used for post-retirement indexing, though it is more common in points plans than NDC or valorized earnings

European/FSU Defined Benefit System Summary

- ▶ Points: Croatia, France (occupational plans), Germany, Montenegro, Romania, Russia, Serbia, Slovak Republic

- ▶ NDC: Azerbaijan, Italy, Latvia, Norway, Poland, Sweden, Kyrgyz Republic

- ▶ Basic Benefit only: Armenia

- ▶ Valorized earnings: All other

- ▶ Many countries use a combination of Basic Benefit and DB, or DB/NDC/points and funded DC

Comparison of System Transparency

	Valorized Earnings	NDC	Points
Retirement Ages	Explicit	Explicit	Explicit
Years of service	Explicit	Implicit	Explicit
Individual average pay	Explicit	Implicit	Implicit
Accrual rate	Explicit	Implicit	Implicit
Early and late retirement factors	Explicit	Implicit	Explicit
Post-retirement indexing	Explicit	Either	Explicit
Longevity adjustments	Explicit	Implicit	Explicit

Conversion Among Designs

▶ Each method can be converted from one to another by formula, assuming the valorization method is the same

▶ To simplify the discussion, make the following assumptions:

  ▶ Retirement decrement only (no disability or survivor benefits)

  ▶ Everyone works full-time, contributes every month, and earns a full-year of pay each year

  ▶ Individuals' valorized earnings, NDC account balance and point values are valorized to change in national average wage

  ▶ Plan has actuarial increase and decrease factors for late/early retirement

▶ Assume valorized earnings formula = average valorized earnings over full career * 1% * years of service

Convert Valorized Earnings to Equivalent NDC

▶ Set the life expectancy factor at standard retirement age (assume 19)

▶ Set life expectancy factor at other ages = 19 / actuarial factors for valorized earnings plan

▶ Set contribution rate = 1% * life expectancy factor at standard retirement age = 19%

▶ Credits to notional account will automatically adjust for size of pay and years of service (contribution density)

▶ If salary history, indexing rate and other factors are the same, then retirement benefit will be the same

Convert Valorized Earnings to Equivalent Points

- Set initial point value = national average wage * 1%

- Valorize point value to change in national average wage

- Number of points each year will automatically adjust for size of pay and year of service (contribution density)

- Size of retirement benefit will be the same

- In Russia's case

  - Initial point value = national average wage earnings * 1% / points awarded for someone earning average wage (assumed to be 5)

  - Points each year = 10 * individual earnings / maximum pensionable earnings (assumed equal to 5 for someone earning average wage)

Convert NDC to Equivalent Points

- Set initial point value = national average wage * contribution rate / NDC annuity factor at standard retirement age
    - And in case of Russia, divide by number of points awarded for someone earning the average wage

- Set actuarial increase or decrease factors = NDC annuity factor at standard retirement age / NDC annuity factor at each possible other retirement age

- Valorize point value in same way as NDC accounts

- Number of points each year will automatically adjust for size of pay and years of service (contribution density)

- Size of retirement benefit will be the same

Simple Illustration of Equivalency

Provision	Values
Normal retirement age (NRA)	60
Initial average monthly wage (RUB)	50,000
Initial maximum monthly wage (RUB)	100,000
Initial individual monthly wage (RUB)	50,000
Average wage increase	5%
Individual wage increase	4%
Accrual rate	1%
NDC contribution rate	19%
NDC conversion factor at standard retirement age	19
Initial point value (average wage * 1% / 5)	100

Simple Illustration of Equivalency

Age	Average Annual Wage	Maximum Annual Wage	Individual Annual Wage	Valorized Annual Earnings	NDC Account Balance	Point Value	Points
40	600,000	1,200,000	600,000	1,516,170	114,000	100.00	5.00
41	630,000	1,260,000	624,000	1,501,730	238,260	105.00	9.95
42	661,500	1,323,000	648,960	1,487,428	373,475	110.25	14.86
43	694,575	1,389,150	674,918	1,473,262	520,384	115.76	19.72
44	729,304	1,458,608	701,915	1,459,231	679,767	121.55	24.53
45	765,769	1,531,538	729,992	1,445,334	852,453	127.63	29.29
46	804,057	1,608,115	759,191	1,431,569	1,039,323	134.01	34.02
47	844,260	1,688,521	789,559	1,417,935	1,241,305	140.71	38.69
48	886,473	1,772,947	821,141	1,404,431	1,459,387	147.75	43.32
49	930,797	1,861,594	853,987	1,391,055	1,694,614	155.13	47.91
50	977,337	1,954,674	888,147	1,377,807	1,948,092	162.89	52.45
51	1,026,204	2,052,407	923,672	1,364,685	2,220,995	171.03	56.95
52	1,077,514	2,155,028	960,619	1,351,688	2,514,562	179.59	61.41
53	1,131,389	2,262,779	999,044	1,338,815	2,830,109	188.56	65.83
54	1,187,959	2,375,918	1,039,006	1,326,064	3,169,025	197.99	70.20
55	1,247,357	2,494,714	1,080,566	1,313,435	3,532,784	207.89	74.53
56	1,309,725	2,619,450	1,123,789	1,300,926	3,922,943	218.29	78.82
57	1,375,211	2,750,422	1,168,740	1,288,536	4,341,151	229.20	83.07
58	1,443,972	2,887,943	1,215,490	1,276,264	4,789,152	240.66	87.28
59	1,516,170	3,032,340	1,264,110	1,264,110	5,268,790	252.70	91.45
Monthly Benefit				23,109	23,109		23,109

Calculation of Benefit

- Valorized Earnings: Sum of valorized annual earnings * 1% / 12 = 23,109

- NDC: NDC account balance / conversion factor / 12 = 23,109

- Points: Number of points * point value = 23,109

- Set annual individual wage increase to any rate, and the equivalency also holds

- Results will differ based on alternate career paths

Why Choose One Formula over Another?

- "Marketing" – manner in which benefit calculation is presented to participants

- Ease of communication

- Design and history of prior pension plan

- Sophistication of pension administrative systems

- Willingness to adjust contribution rates and/or replacement rates

- Desired degree of transparency

- Ease of making ad-hoc adjustments

Making Pension System Self-Adjusting

- ▶ Revenue = Expenditure each year

- ▶ Revenue = Wage Fund x contribution rate = number of contributors x average wage x contribution rate

- ▶ Expenditure = number of pensioners x average pension

- ▶ Required contribution rate = (# pensioners / # contributors) x (average pension / average wage) = **dependency ratio x replacement rate**

- ▶ To keep contribution rate constant, replacement ratio must go down as dependency ratio goes up

Making Pension System Self-Adjusting

▶ Valorizing to average wage (most common method in points and NDC plans) will not accomplish this

▶ NDC: Often indexes to wage fund (or contribution revenues) and adjusts annuitization factor for increasing life expectancy, which solves much of the problem

▶ Points: German formula adjusts for changes in dependency ratio and for changes in contribution rate. Makes points system behave more like an NDC

Conclusion

- NDC and points systems are brother/sister formulas; they are different ways of expressing the same thing

- Goals and objectives and pension system history may help policymakers decide which is a better fit for their country

- Degree of transparency and ease of comparison with valorized earnings formula differ between points and NDC

- German points system has "adjustment mechanism" that makes it behave similarly to an NDC plan indexed to wage fund with adjustable conversion factors

- Russian points system has moved away from formula approach to specified point values (and flat benefits), at least for 2019-2024