MONGOLIA

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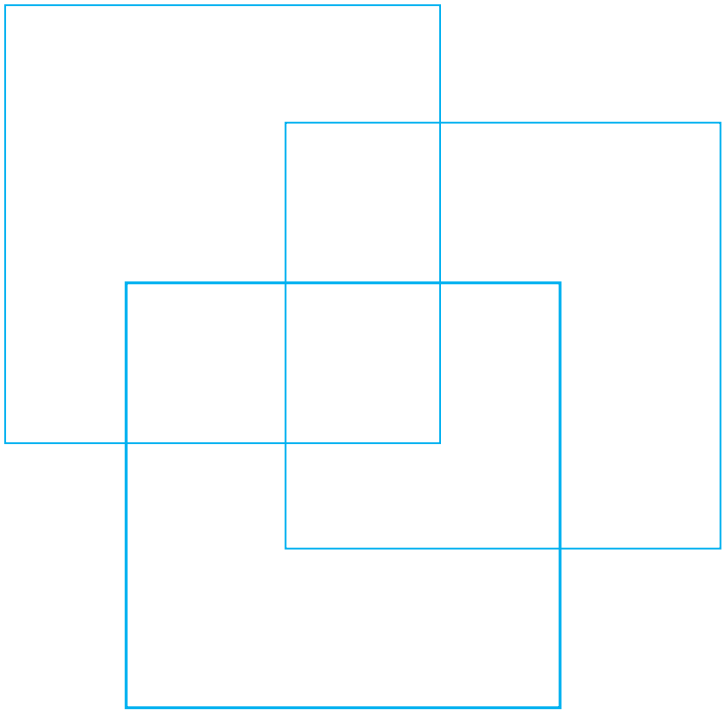
International Labour Organization

Financial assessment of the proposed reform to the social security system for older persons and a proposed new pension scheme for the herders and self-employed persons



Social Protection Department, Geneva
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Public Finance, Actuarial and Statistical Services Branch
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EXECUTIVE SUMMARY

A new pension reform policy has been submitted to the Parliament which would considerably modify the current pension system. Modifications to the benefits of the Law on Pensions and Benefits provided by the Social Insurance Fund (increase in retirement age and increase in the number of years used for calculating the reference salary for pension) and the postponement of the application of the Law on Individual Pension Insurance Contribution Account to those born after 1979 instead of 1959 are addressed in this policy. The main reasons justifying the pension reform are the important difference between the benefits payable under the Law on Pensions and Benefits provided by the Social Insurance Fund and the Law on Individual Pension Insurance Contribution Accounts as well as sustainability concerns. Like many pension systems, pressures on the Mongolian scheme are foreseeable in the future. According to a World Bank's report released in 2011, the fund deficit is expected to increase from around 2 per cent of GDP today to 4 per cent in 2020 and 7 per cent in 2030. Modifications to the current system are planned to be in force in 2017. Prepared at the request of the Ministry of Population Development and Social Protection, and discussed with social partners, the present report assesses some aspects of the proposed reform.

The switch from a defined benefits (DB) system to a notional defined contribution (NDC) system would not make the system financially more sustainable and affect the level of benefits. Most of reform outcomes of an introduction of a NDC system can be achieved by parametric reforms of a DB system with a transition period that will prevent a sudden decrease in income replacement for new retirees and progressive and acceptable increase of the contribution. All the parameters of the proposed reform are not yet defined. These parameters will have a considerable effect on the benefit level as well as the financial sustainability of the system. It is recommended to set all the parameters by paying due attention to policy coherence and on the consistency of the complete system, as well as the transition measures which were missing when moving from DB to NDC systems. Also, while systemic or parametric reforms are essential to make a system more sustainable, it is important to realize that improvement of the management of some benefits can also be beneficial to the scheme, as for instance the administration of the disability benefits in the case of the Mongolia's system.

To address these unavoidable challenges, a three tier system is recommended to enhance the sustainability of the system while ensuring adequate old age protection. The overall adequacy of pension provisions, as well as how they are provided from different pension tiers, are some of the most important design issues of a pension system. Once decided the target overall income replacement level, a combination of different pension tiers is examined to reach the targeted level. The proposed design is:

First tier	Universal pension	1. Non-contributory 2. Indexed on salary for new retirees 3. Indexed on inflation for pensioners 4. In replacement of the current contributory minimum pension
Second tier	Mandatory social insurance pension for both workers of the formal and informal sectors, including herders and self-employed	1. DB scheme with an annual accrual rate of 0.95 per cent by year of service 2. Indexed on inflation 3. Eligibility for old age pension starting after the first month of contribution
Third tier	Voluntary supplementary DC pension	1. Financial defined contribution plan (with the objective of increasing the pension above the 40 per cent guaranteed by the first and second tiers)

The society of Mongolia will age considerably in the coming years, with 20 per cent of the population aged over 60 years old in 2050. The report recommends the introduction of a universal pension to guarantee that everyone enjoy at least a minimum income security. The current Mongolian pension system is universal in a sense that those who do not receive a social insurance pension receive a tax-based welfare pension. Furthermore, the introduction of a universal pension would simplify the coordination between schemes and lead to a rationalization of the overall pension system, together with smoothing the transition period.

The current old age pension satisfies the minimum requirements of ILO Social Security (minimum standards) Convention, 1952 (No. 102) since the income replacement rate of the old age pension reaches 45 per cent after 20 years of contribution. The compliance of the new NDC old age pensions depends on the level of universal pension, or minimum pension, as well as the conversion factor at the time of retirement. The coordination and integration of all tiers of a social security system is very important for the scheme to achieve its major objectives. The financial assessment concludes that it will be difficult to design a NDC scheme compliant with the principles of benefit adequacy and predictability as set out by the international labour standards, notably Convention No. 102. With the increase of life expectancy at retirement, the level of pension under the NDC scheme will inevitably decrease. Parameters such as retirement age and the contribution rate are also essential to consider for enhancing the sustainability of the system.

The coverage of herders, self-employed and informal economy workers is currently voluntary and they make a choice; either receiving a social welfare pension without paying contributions or receiving a social insurance pension by paying voluntary contributions. A voluntary social insurance system should be designed in a way to encourage people to contribute. For the future, it is highly recommended to maintain them under the general scheme instead of creating a separate pension scheme for them. Maintaining them under the general scheme facilitates better risk management through risk pooling and administrative simplicity (issues of portability of entitlements accrued under different schemes), and addresses concerns of financial sustainability of the scheme where future contributors are expected to substantially decrease. Indeed, it is important not to create a structure where people financially the most vulnerable are in a situation where they assume risks of their peers too. Also, maintaining them under the general scheme promotes social solidarity with this vulnerable category of the population, and ensures that they access to same benefits as the rest of the population. Certain flexibility and special arrangements, especially in the case of a transition to a compulsory scheme for this group, in particular in terms of contribution through subsidies and administrative framework, are needed to facilitate the enforcement of the reform.

Finally, currently, there are no formal financing objectives for the funding of the social security system in Mongolia. To accompany any social security reform, a funding policy is necessary. It is recommended that discussions should take place among stakeholders on the implementation of an explicit endorsed funding policy, well planned and periodically reviewed in the future.

ABBREVIATIONS AND ACRONYMS

ABND	Assessment-based national dialogue
CPI	Consumer Price Index
CMTU	Confederation of Mongolian Trade Unions
DB	Defined benefits
DC	Defined contributions
FDC	Financial defined contributions
Funding ratio	Ratio of assets of a pension fund over the liabilities
GAP	General Average Premium
GDP	Gross Domestic Product
HDF	Human development fund
ILO	International Labour Office
MONEF	Mongolian Employers' Federation
NDC	Notional defined contributions
NSO	National Statistical Office
PAYG	Pay-as-you-go
Reserve ratio	Ratio of end-of-year reserve to annual expenditure
SIGO	Social Insurance General Office
TFR	Total fertility rate

INTRODUCTION

In 1995, the pension system in Mongolia was reformed. Currently, the system is based on a highly Government subsidized social security scheme and on social welfare pension. The social security pension system is a pay-as-you-go system. The level of benefits depends on the date of birth of the insured. For members born before 1960, this is a DB pension scheme while, for those born after 1959, it is a NDC scheme. Previous studies done by the ILO and the World Bank point out that those who will receive benefit under the NDC scheme will receive considerably lower benefits than those under the previous DB plan.

The coverage of herders and the self-employed is an important feature of the social security system in Mongolia. As opposed to salaried workers who are compulsorily covered, the herders and the self-employed are covered on a voluntary basis. This also raises concerns relating to the level of retirement income these groups of insured are going to receive in the future. While most of the employees in the private and public sector are covered, for the herders, self-employees and informal economy workers, the proportion is around 9 per cent.

At the beginning of the year 2015, a draft State pension reform policy for 2015 to 2030 was submitted to the Parliament. The reform objectives are guided by the introduction of comprehensive reforms guaranteeing social protection for the Mongolian elders by introducing multi pillar pension schemes.

The ILO received a request from the Government of Mongolia to support the actuarial and institutional design of a new pension scheme for the herders, self-employed and informal economy workers. In May 2014, a tripartite Project Steering Committee was formed to guide the work on the pension reform. Since then, several options of pension design have been discussed and proposed by social partners. This study was carried out under the terms of an agreement concluded between the ILO, and Mr Georges Langis, F.S.A, F.C.I.A, consultant actuary of the ILO. Mr Langis went to Ulaanbaatar from 8 to 13 September 2014 to gather the necessary data for the valuation in collaboration with different partners and to hold discussions with social partners through different workshops (CMTU, MONEF, ABND and the tripartite). Mr Langis has worked in close collaboration with Mr Enkhtuvshin Gunchinsuren, a national consultant, to gather the necessary information. It is also important to note that in addition to the preparation of this document, the terms of reference between the ILO and Mr Langis include some work related to an actuarial training in order to enhance the actuarial capacity building of different partners in Mongolia. The training sessions were delivered in December 2014, during the second mission of Mr Langis in Mongolia.

Mr Hiroshi Yamabana of the ILO Public Finance, Actuarial and Statistical Services Branch assumed responsibility for the supervision, review and editing of this study. The release of this report is part of a project supervised by Celine Peyron Bista, Chief Technical Advisor on Social Security of the ILO/Japan project for promoting and building social protection in Asia, focus on Mongolia (2014-2016).

The authors are grateful to the Government of Mongolia and the social partners for their support throughout this assignment. In particular,

Ms Munkhzul Lkhagvasuren, Director of the Department, Ministry of Population Development and Social Protection, furnished invaluable and timely assistance and thus expedited the preparation of this report.

This report has five chapters. The first chapter presents a brief description of the context of the social security system in Mongolia. Chapter 2 concentrates on comments on the proposed reform, while Chapter 3 presents the recommendation on the implementation of a separate scheme for herders. Chapter 4 is the conclusion of this study. Additional detailed information is included in the Appendices.
The quality and reliability of the data used for this actuarial study is not the responsibility of the ILO. In the process of the valuation, checks have been made on the data collected to ensure that they are consistent. It is important to bear in mind that the data collected does not automatically enable a production of an actuarial valuation of reasonable quality. However, collected data allow for analysing and commenting on the current and planned pension systems in Mongolia.

1 DESCRIPTION OF THE CURRENT PENSION SYSTEM IN MONGOLIA AND THE PROPOSITIONS

1.1 The current pension system

The current pension system is composed of four schemes

- The military personnel are covered by the Law on Pension and Benefits of Military Service Personnel. This pension scheme is non-contributory and gives a protection up to 80 per cent of the monthly average wage for those who qualify.
- Law on Pensions and Benefits provided by the Social Insurance Fund, 07 June 1994: All employees born before 01 January 1960 are covered by a mandatory contributory defined-benefit scheme. The herders, self-employed and informal economy workers are covered by the scheme but the contribution rate is different.
- Law on Individual Pension Insurance Contribution Accounts, 10 June 1999: All employees in the formal sector (contract employees of the private sector and those who are civil servants) born after 1959 are covered by a notional defined contribution (NDC) scheme. The herders, self-employed and informal economy workers are covered on a voluntary basis.
- Those who are not provided with a social insurance security pension (including those having less than ten years of contribution in the social insurance scheme) are covered by a social and welfare pension scheme. The benefit in 2014 was 115,000 Mongolian tugrug (MNT) per month.

Appendix 1 provides more details on benefits provided by Law on Pensions and Benefits provided by the Social Insurance Fund and Law on Individual Pension Insurance Contribution Accounts.

A new pension reform policy has been submitted to the Parliament which would considerably modify the current pension system. For example, modifications to the benefits of the Law on Pensions and Benefits provided by the Social Insurance Fund (increase in retirement age and increase in the number of years used for calculating the reference salary for pension) and the postponement of the application of the Law on Individual Pension Insurance Contribution Account to those born after 1979 instead of 1959 are addressed in this policy. The main reasons justifying the pension reform are the important difference between the benefits payable under the Law on Pensions and Benefits provided by the Social Insurance Fund and the Law on Individual Pension Insurance Contribution Accounts as well as sustainability concerns. Modifications to the current system are planned to be in force in 2017. This report will discuss some aspects of the proposed reform.

In 2013, 230,000 persons received social insurance old age pensions. 63,000 received tax-based welfare pensions, and 15,000 ex-military persons received pensions. The following table summarizes the numbers of pensions and the average pension benefits.

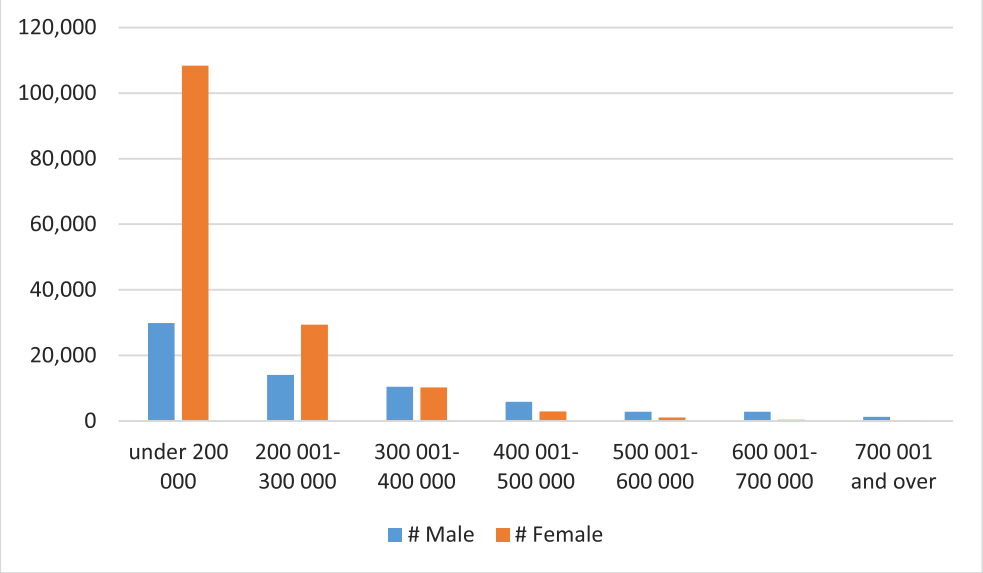
Table 1.1 Summary of the pensions paid by the pension system, 2013

	Number of pensioners	Average annual pension (MNT)
Retirement - SIGO	230 300	2 576 068
Disability - SIGO	64 500	1 937 147
Survivors - SIGO	27 400	1 838 109
Military - SIGO	14 700	4 687 592
Social Welfare	63 400	1 253 475

Source: NSO

Figure 1.1 shows the distribution of the old-age pensioners by sex and by the amount of pension in December 2013. For retirees having contributed for 20 years, they are eligible to a minimum monthly pension of MNT207,000 which is over the minimum salary of MNT192,000. For retirees having between ten to 20 years of service, the minimum pension is prorated. Figure 1.1 clearly illustrates that over 50 per cent of the retirees are provided with the minimum pension. Before reaching the current level of MNT207,000 or 108 per cent of the minimum salary, the minimum pension was 75 per cent of the minimum salary. This implies some workers receive less than pensioners. This could raise a serious question on the equity between workers and pensioners as well as the overall financial sustainability of the current pension system in the context of an ageing society.

Figure 1.1 Distribution of the number of retirees by sex and by the level of retirement pension, 2013 (MNT)



Source: SIGO

Table 1.1 shows that on average a social insurance pensioner receives twice as much as the Social Welfare pensioner. The coverage of herders, self-employed and informal economy workers is currently voluntary and they make a choice; either receiving a social welfare pension without paying contributions or receiving a social insurance pension by paying voluntary contributions. A voluntary social insurance system should be designed in a way to encourage people to contribute. Box 1 contains an example showing how system parameters can affect the decision to or not to contribute to a voluntary social insurance pension system. In fact it shows the effect of having a minimum pension equal to 75 per cent of the minimum salary (MNT144,000) or at the current minimum pension equal to 108 per cent of the minimum (MNT207,000). Parameters will also affect the financial sustainability of a system.

BOX 1.

An example of the impact of parameters

The amount of the welfare pension is compared to the net amount of the pension by taking into account the amount of social insurance pension contributions paid during the active life. Following assumption are adopted for the estimates:

- Annual inflation rate of 4.5 per cent;
- Annual real increase of salaries of 3 per cent;
- Annual real rate of return on assets of 3 per cent by year;
- The minimum salary and the welfare pension are increasing at the same rate with the salary increase;
- The individual contributes for 35 years based on the minimum salary (MNT192,000 per month in the current year and increased in line with the salary increase), retires at age 60 and receive the minimum pension (75 per cent of the minimum salary);
- The welfare pension is MNT115,000 per month.

With a minimum pension of 75 per cent of the minimum salary, the value of the minimum pension is 25 per cent higher than the value of the welfare pension. However, if the net value of benefits, namely the value of the minimum pension less the amount of contributions paid to the scheme (10 per cent by year for the voluntary scheme) is compared to the value of the welfare pension, the net value of the benefits of the social insurance scheme is 12 per cent lower than the value of the welfare pension. From a pure economic viewpoint, before the establishment of the new minimum pension equal to 108 per cent of the minimum wage, there was no incentive to contribute to the social insurance system.

By applying the new minimum pension, the net value of the benefits of the social insurance scheme is 43 per cent higher than the value of the welfare pension, which gives incentives for people to contribute. However, this relatively high amount of the minimum pension leads to a serious concern of equity between workers and pensioners as well as financial sustainability of a social insurance pension system in the context of an ageing society.

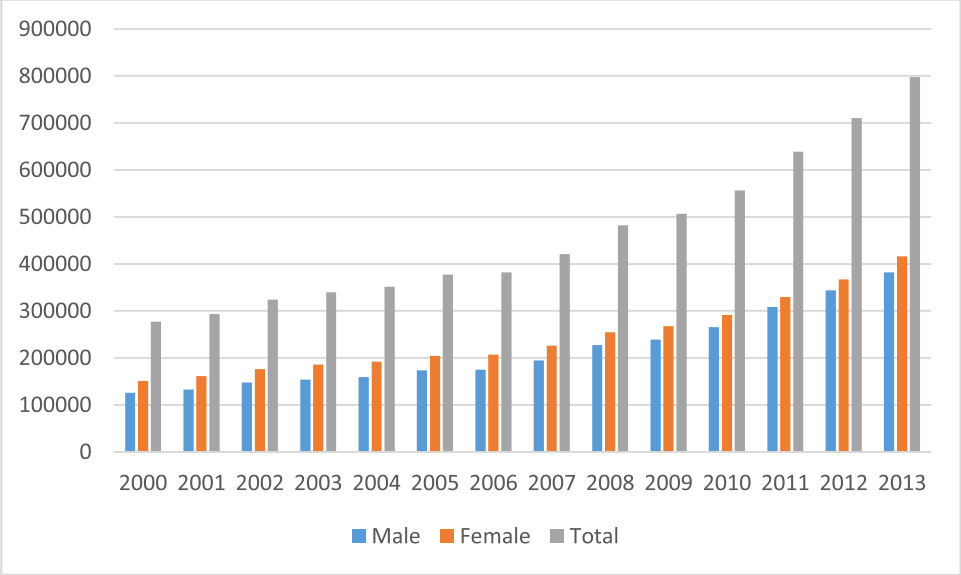
All the parameters of the proposed reform are not yet defined. These parameters will have a considerable effect on the benefit level as well as the financial sustainability of the system. It is recommended to set all the parameters by paying due attention to policy coherence and on the consistency of the reformed system so that the reform objectives can be achieved.

Figure 1.2 shows the evolution of the number of contributors. Between the year 2000 and 2013, the number of contributors increased by an annual average rate of 8.5 per cent. During that period, it is estimated that the employed population increased at an annual rate of 2.3 per cent.[1] This means that the speed of the coverage expansion of the social insurance pension has substantially exceeded that of the employment increase since 2000. The increase in the number of contributors has accelerated since 2009, mainly due to a substantial increase of the voluntary system. 514,000 contributors of the mandatory system in the year 2009 increased to 767,000 in 2013, with a growth of 49 per cent while the number of contributors of the voluntary scheme increased from 50,000 in 2009 to 148,000 in 2013, with a growth of 200 per cent.

In 2013, 0.8 million out of the 1.3 million workers in the labour force contributed to SIGO, implying 62 per cent of the labour force contributed to the social insurance pension scheme. Although there is still room for extending coverage, the pace will become slower and it impacts the financing of a PAYG social insurance system.

[1] *ILO*

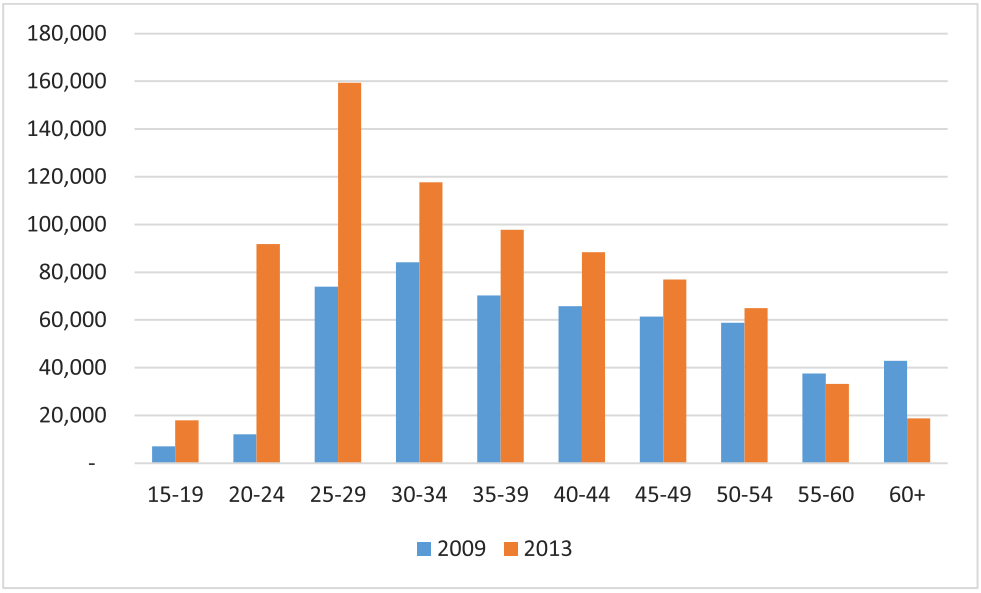
Figure 1.2 Evolution of the insured population, 2000-2013



Source: SIGO

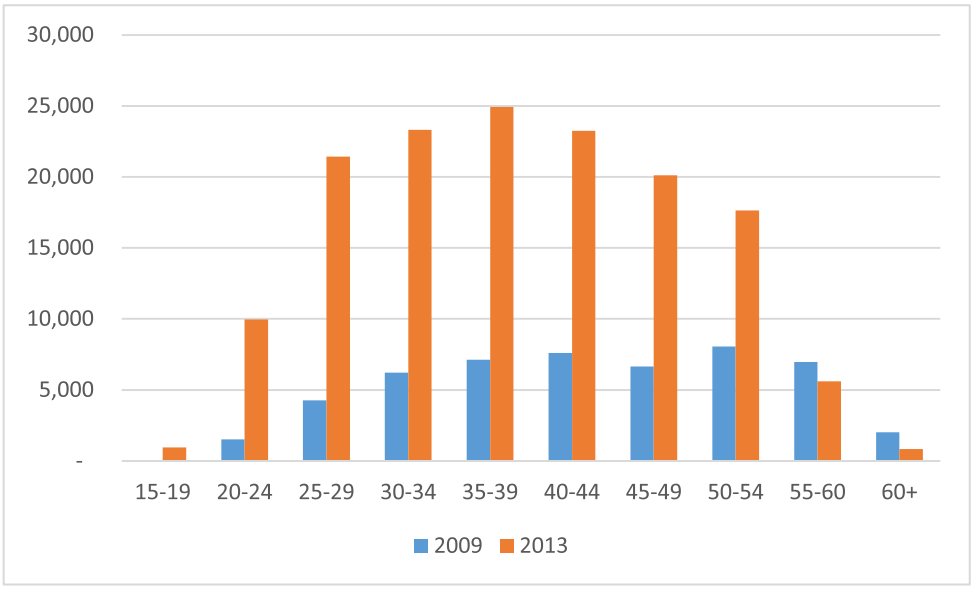
As shown in the two followings graphs, the increase in the number of contributors is not only happening with the old age workers. In fact, it is also present in the younger generation, especially in the mandatory system.

Figure 1.3 Number of contributors of the mandatory social insurance scheme by age 2009-2013



Source: SIGO

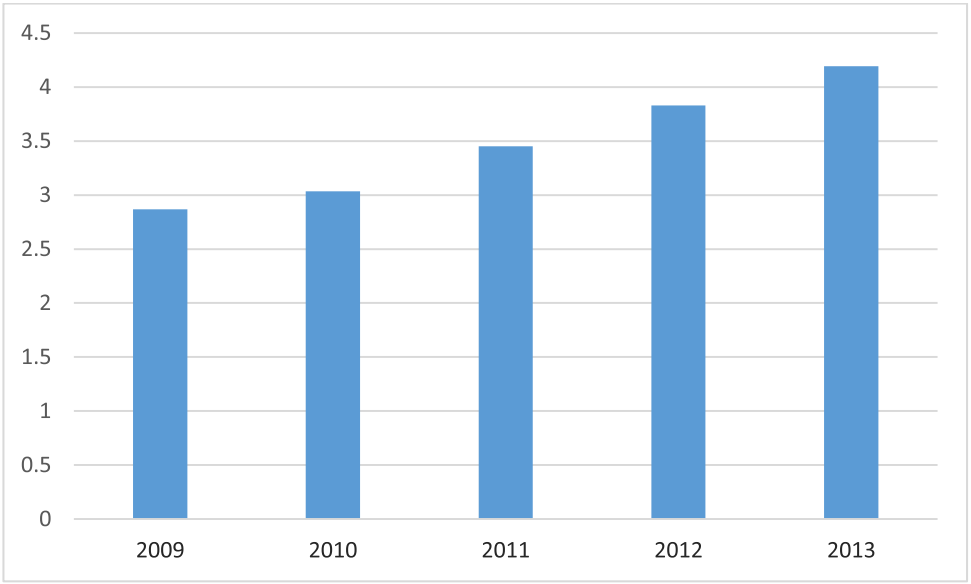
Figure 1.4 Number of contributors of the voluntary social insurance scheme by age 2009-2013



Source: SIGO

The next graph shows the evolution of the dependency ratio, defined as the number of contributors divided by the number of old age pensioners, for the period between 2009 and 2013. Since the social insurance system is based on the PAYG financing method, the future evolution of the dependency ratio will have a considerable effect on the financing of the pension system. There were 2.9 contributors for each pensioner in 2009 while there were four contributors for each pensioner in 2013, a result of the substantial increase in the number of contributors during the period.

Figure 1.5 Dependency ratio, 2009-2013



1.2 Financial statement and current financial situation

This section gives an overview of the financial statement of the pension branch of the system, namely old age, disability and survivors benefit branch of the SIGO. Analysis was not carried out for short-term cash benefits, work injury and occupational diseases, unemployment and health insurance.

For the pensions branch, the contribution rate is 14 per cent for the mandatory system, equally shared between employers and employees, and 10 per cent for the voluntary system to which herders, self-employed persons, informal sector workers, members of cooperative, monks and priests can contribute. It should be noted that the contributions rate was decreased for the mandatory system from 19 per cent to 14 per cent in 2008.

Table 1.2 Summary of contribution income and expenditure, SIGO, 2011-2013, million

	2010	2011	2012	2013
Contributions Income	242 411	340 376	485 014	589 118
Employers	76 665	136 956	196 821	235 915
Employees	117 765	148 953	207 338	252 471
Organizations financed by state budget	41 100	43 880	66 626	78 959
Voluntary scheme	6 882	10 586	14 229	21 773
Expenditure	368 346	450 243	722 531	826 692
Old age pension	265 612	328 727	516 652	593 299
Disability pension	45 333	53 483	87 939	98 933
Survivor pension	25 086	27 954	43 029	45 718
Military pension	24 398	30 633	61 763	72 638
Other	7 917	9 446	13 148	16 105
Administrative expenditure	N/A	7 811	11 609	11 811
Deficit	(125 935)	(117 678)	(249 126)	(249 384)
Subsidies from the Government	170 667	187 901	272 730	264 573
Payments for military pensions and pensions for pre-1995 retirees	132 364	152 106	272 730	259 055
Subsides from state budget, or, assets re-allocated to the pension insurance fund	38 303	35 795	-	5 518

Source: Annual report, SIGO

It is difficult to have a clear overall financial picture of each branch since administrative expenditure as well as investment expenses are not allocated to each branch.

Over the period between 2010 and 2013, the contributions income increased by 143 per cent and the benefits expenditure by 144 per cent. The PAYG cost rate in 2013, which is a contribution rate necessary to pay all the benefits expenditure of that year, is around 19 per cent; or 17.3 per cent if military personnel pensions are excluded from the expenditure.

SIGO has faced a deficit each year. The Government provided subsidies to pay pensions for ex-military

personnel and pre 1995 retirees as well as to cover the deficit. In 2013, the Government paid 264,573 million tugrug, which was 1.5 per cent of GDP or 5.3 per cent of Government's total expenditure. It was projected that deficits would continue to grow and reach 13 per cent of GDP in 2085 under the current DB system in the last actuarial valuation report.[2] The report showed that the deficit under the NDC system is expected to be 6.5 per cent of GDP.

In 2010, the ILO published a report[3] which highlighted the need for important reforms to the pension system in Mongolia. A section of the report pointed out the absence of transition mechanisms from the current DB system to an NDC system:

> In fact, a reform of this type, from a PAYG-financed DB scheme to a funded Defined Contribution (DC) scheme, always incurs a so-called "transition cost". To be able to conduct an effective conversion, the transition cost, which essentially represents pension liabilities accumulated under the old PAYG system as at the date of conversion, must be quantified and met through the identification and reservation of appropriate financing resources. International practice varies; the cost might be born wholly by the Government or shared amongst the pension scheme participants.
>
> In the case of Mongolia, it seems that neither the 1999 Law on "Individual Pension Insurance Contribution Accounts" nor the associated Guidelines envisaged any additional financing arrangements to meet such a need, nor unfortunately did the statutes require the carrying out of an actuarial assessment that would have been expected to quantify the relevant liability.

The objectives of the 1999 reform (from a DB system to an NDC system) were:

- Preserving the concepts of fairness and individual equity in how workers are treated by the system;
- Protecting the needs and persons close to retirement;
- Ensuring that current workers receive reasonable pension benefits when they retire, without unreasonable risks;
- Making the pension system financially stable and eliminating the dependence of the system on the general budget; and
- Encouraging the development of capital markets and increasing economic growth.

The strategy of implementing the new pension system indicated a gradual move from a pure PAYG system to a partially funded system where the retirement income would come from both an NDC and a defined contribution (DC) scheme. The notional rate of return on the individual account of the NDC scheme is equal to the average growth of the national wage while the return of the DC scheme is generated from the investment of the assets. This strategy was in line with the objective of developing capital markets in Mongolia, but such a partially funded system has not yet been implemented. Few objectives of the 1999 reform have been achieved. It is important that a reformed overall system should be well thought, designed and analysed by paying due attentions to the complete system as well as the transition measures.

1.3 Policy gaps and issues

From 2013 to 2014, a social protection assessment-based national dialogue (ABND) exercise was undertaken in Mongolia. The ABND report has analysed the whole social protection system and shown the coverage gaps and the implementation issues of the existing social protection schemes. The ABND aims at providing recommendations for the further design and implementation of social protection provisions. The ABND has highlighted the following issues of the pension system:

- **Coverage under the voluntary scheme:** Very low coverage, especially for young people, herders and the self-employed;
- **Funding:** The DB pension system currently operates on a PAYG basis. The fund is currently in deficit and some projections show that these deficits are likely to grow in the future, even after considering the impact of the 1999 reform. Current contributions under the new NDC system are used to finance the pensions of the pre 1960 cohorts, even with additional complementary funds from the State budget;
- **Indexation:** The level of pension benefits adjusted in ad-hoc manner, no indexation stated in the Act;
- **DB vs. NDC conflict:** Problems in the parameters of the DB and NDC schemes leading to a necessary pension reform:
  - Workers born after 1960 will have substantially lower retirement benefits than workers born before 1960.
  - Early retirement pensions under the NDC scheme for those born after 1960 will be

[2] *Analysis of the Mongolian Pension Insurance Fund, Report on the Baseline PROST Projections, from 2013 to 2085*

[3] *Old-age Pension Reform: A review of the 1999 pension reform for the Ministry of Social Welfare and Labour*

lower than pensions awarded at the normal retirement age.
- Level of benefits: inadequate level of pension to be paid under the individual account system, low retirement age that provides low level of benefits, in particular for women;
- Equality of treatment: Unequal retirement age between men and women.

Concerns that have been raised in the ABND sessions were also shared by the Government. A major concern for the Government is the growing pension fund deficit that is expected to increase from around 2 per cent of GDP today to 4 per cent in 2020 and 7 per cent in 2030. Challenges include preventing a too drastic decrease of the benefits due to the transition from the DB to the NDC scheme as well as a well-designed pension plan for herders, self-employed persons and workers in the informal sector and implementation of a voluntary third pillar pension scheme for the private sector workers.

1.4 Discussions and solutions

The following recommendations came out from the ABND exercise for extending and improving old age protection:
- Introduce a three pillars pension system: Pillar 1; Universal minimum pension; Pillar 2: Mandatory as well as voluntary contributory social insurance (SI) pension; Pillar 3: Supplementary individual saving accounts;
- Encourage contributions of herders and self-employed person to the SI pension scheme by introducing a Government subsidy;
- Establish a long term care system that will provide holistic protection to older people, namely income as well as health security with dignity.

In addition to the ABND exercise, tripartite workshops were held in Mongolia where the employers (MONEF), the unions (CMTU) and the government sat together to discuss the pension system and more precisely the cases of herders, self-employed persons and informal sector workers. Main concerns related to the pension plan of the herders, self-employed persons and workers in the informal sector are:
- Tier 1 should be universal and it also needs to be increased annually in line with inflation. MONEF agrees on a three-tier system, but raises questions related to the universality of the first tier and suggested that it may be better to target basic provisions to the most vulnerable people.
- Herders, self-employed persons and informal sector workers to be covered by mandatory social insurance and equal amount of government subsidies, but the overall contribution rate for herders, self-employed persons and workers in the informal sector should not be less than the one for other workers.
- Equalize retirement ages of men and women.
- Introduce flexible contribution payments, especially for herders, self-employed persons and informal sector workers.
- Employers are very interested in the third-tier private pension plan on top of social insurance.

A draft State pension reform policy for 2015 to 2030 was submitted to the Parliament at the beginning of the year 2015. The policy reform objective is a comprehensive reform guaranteeing social protection for the Mongolian elders by introducing multi-tier pension schemes. This is done through:
1. Modifying pension parameters of the existing system;
2. Modifying pension benefits of the existing system;
3. Introducing a special scheme for herders and self-employed persons; and
4. Introducing individual savings accounts.

The key features of the draft policy report with regard to the general system are:

- Establishment of a multi-tier pension system;
- A member born between 1960 and 1979 that was expected to receive an old age pension under the current NDC scheme may opt out and choose the benefits under the old PAYG system;
  - The accrual rate for those born before 1 January 1979 will be not less than 2 per cent for each year of contribution;
  - The reference period of wage for the calculation of pension benefits will be extended from five to ten years between 2020 and 2025; and
  - Guaranteed minimum pensions are provided for this cohort;

- For those born after 01 January 1979, the NDC formula will apply. The NDC will be financed on a PAYG basis. A partially funded scheme will be considered after 2030;

- For those born after 01 January 1979, basic universal social pension will be introduced for replacing the current social welfare pension; and
- Contribution rates for the pension fund will be increased from 18 to 19 per cent in 2017 with employers' contribution rate of 9 to 10 per cent and employees' contribution rate of 9 per cent.

A special separate scheme for herders, low income self-employed persons and informal workers is going to be implemented with the following features:

- Matching contributions from the state (at least 50 per cent subsidized);
- The scheme will be mandatory. Major scheme designs such as contribution rates, eligible periods, pensionable age will be regulated by a separate law;
- Benefit formula will be simple, clear and linked to length of contribution period;
- The scheme will be administered by a social insurance agency; and
- Accumulated funds in the special scheme will be invested in financial instruments and securities like government bonds etc.

It seems that there is no definition of low income self-employed and informal workers.

Table 1.3 Proposed solutions to the general pension system

Basically, the solutions of the Government to make the system more sustainable are quite similar to the recommendations of development partners: Implementing a three-tier system and changing some key parameters such as retirement age and accrual rate. Differences exist in some of the design features. For example, the ILO recommends an introduction of a universal tax-based pension while the World Bank recommends a proxy-means-tested social pension.

Law of 1995 or defined benefit system (DB)		
Parameters	Current system	Proposed system
Retirement age	Male 60 years old / Female 55 years old	Under study
Contribution rates	14%	19%
Pension accrual rate	first 20 years = 45% (2.25% by year) and excess of 20 years = 1.5% per year	2% by year
Reference years to calculate the pensions	5 years	10 years
Indexation of pension	ad hoc	linked to the salary increase
Law of 1999, or Notional Defined Contribution system (NDC)		
Accessibility of NDC	Born after 1960/01/01	Born after 1979/01/01

Coverage extension is a huge challenge. Currently the coverage of the herders and the self-employed persons is voluntary and there is neither incentive nor mechanisms for those workers to save by themselves.

Experiences of many countries show that voluntary social insurance pension systems do not reach substantial segments of the population, especially to those with low income.

As all the current as well as future elderly persons need at least basic income protections, the coverage of the herders and the self-employed persons should be mandatory as drafted in the pension policy reform. As it may be difficult to collect contributions from those people with low income on average, an introduction of a tax-based universal pension will be a more effective solution to provide basic income protection to the elderly.

2 ANALYSIS AND DISCUSSION ON MAJOR ISSUES OF THE CURRENT PUBLIC PENSION SYSTEM AND THE PLANNED REFORM

This chapter provides analysis and discussions on major issues of the current public pension system and the planned reform of the pension system in Mongolia.

2.1 Disability pensions

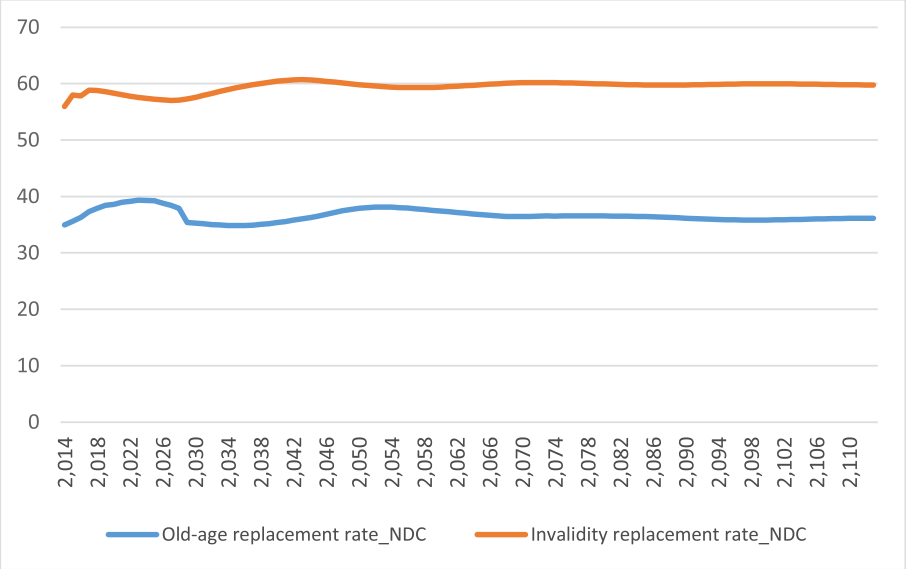
Financial sustainability of a pension system is affected not only by the design and the level of benefits but also by the management and administration of the system. The disability incidence rates of the last actuarial valuation are as follows:

- 1 per cent for a male aged between 40 and 44;
- 2 per cent for a male aged between 45 and 49;
- 3 per cent for a male aged between 50 and 54;
- 4 per cent for a male aged between 55 and 60.

This implies that, out of 1,000 males at age 40, only 600 receive old age pensions at age 60 without taking into account deaths between the age 40 and 60. In reality, even less than 600 receive old age pensions by taking into account deaths for the period. Disability pensions are calculated based on the pension formula and many receive the minimum pension more than the minimum salary. Some of them may find another job and continue to work. Disability pensions, which may be provided substantially for longer periods and to significant numbers of disability pensioners, are costly for the scheme. It is out of the scope of this study to do a more in-depth analysis of the financial impact of costly disability pensions. It is strongly recommended to carry out more in-depth studies and find solutions by tightening the eligibility conditions as well as administration of disability pensions.

An old age pension of the NDC scheme is calculated by dividing the amount accumulated in the notional individual account by a life annuity factor while a disability pension is 60 per cent of the reference salary. Figure 2.1 shows the system replacement ratios of the disability pension and the old age pension provided by the NDC scheme, defined as the average pension amount over the average salary of active members. The figure shows a substantial difference of the benefit level between disability pensions and old age pensions paid out of the NDC scheme. The current high uptake of disability pensions will become even worse by an introduction of the NDC old age pensions.

Figure 2.1 Example of replacement ratio, new pensioners, disability pension and old age pension, NDC system



NB: The annuity factor of the NDC system is set equal to the life expectancy at the time of retirement.

2.2 Income replacement level of old age pensions

A lot of discussions on benefits reform and the financial sustainability of the pension scheme have taken place, but no in-depth discussions have taken place on the benefit adequacy or more specifically, the income replacement level of pensions. The overall adequacy of pension provisions, as well as how they are provided from different pension tiers, are some of the most important design issues of pension schemes.

Table 2.1 presents a summary of the minimum income replacement level of standard beneficiaries of old age, disability and survivors' benefits in the ILO Convention 102. The current old age pension satisfies the minimum requirements of ILO Convention 102 since the income replacement rate of the old age pension reaches 45 per cent after 20 years of contribution.

The compliance of the new NDC old age pensions depends on the level of universal pension as well as the conversion factor at the time of retirement. The coordination and integration of all tiers of a social security system is very important for the scheme to achieve its major objectives.

Table 2.1 Minimum income replacement level for standard beneficiaries of old age, disability and survivors' benefits in the ILO Convention 102

Type of benefits	Income replacement level (%)	Contribution years of standard beneficiaries	Duration of benefits
Old age	40	30 years	Lifetime
Disability	40	15 years	Lifetime, until recovery from disability or until old age pension is paid
Survivors	40	15 years	Lifetime until remarriage or until graduations of schooling of children

After a target of an overall income replacement level of pension is decided, combinations of different pension tiers need to be developed by taking into consideration the different roles of each pension tier.[4] This exercise decides who among the Government, employers or workers will take the direct responsibility of providing benefits, or more concretely, who will bear the cost for benefits. It is also during this exercise that financing mechanisms are established. Different financing mechanism entails different consequences, for example, inter-generational transfers would become more substantial in a PAYG system than fully funded system. Automatic adjustment mechanisms of the scheme's parameters such as retirement ages or contribution rates also need to be considered in order to stabilize the financing of the scheme.

The pension system should also be designed to take into account social and economic contexts of each country and meet its economic development objectives, financial market development and labour market objectives.

2.3 Universal pension

At the 100th Session of the International Labour Conference in 2011, a strategy on the extension of social protection was adopted. The goal was to ensure universal access to essential health care and income security in line with the Social Protection Floors Recommendation, 2012 (Recommendation No. 202). Social protection floors should be guaranteed and defined at the national level in order to alleviate or prevent poverty, vulnerability and social exclusion. These guarantees should be defined in national laws and regulations and should ensure at a minimum that, over the life cycle, all in need (children, working-age population, the elderly and residents) have access to essential health care and

[4] In determining the income replacement level, it is important to take into account tax system of the country. The income replacement level depends on the taxation before and after retirement. It is also essential to pay attention to roles of different tiers, for example, the first tier play a role of poverty alleviation while the second tier provides modest income replacement benefits and the third tier provides top-up supplementary benefits.

basic income security. National social protection floors should comprise at least the following four social security guarantees:

1. access to essential health care, including maternity care;
2. basic income security for children, providing access to nutrition, education, care and any other necessary goods and services;
3. basic income security for persons in active age who are unable to earn sufficient income, in particular in cases of sickness, unemployment, maternity and disability;
4. basic income security for older persons.

A social protection ABND exercise has been done in many countries[5] including Mongolia as discussed in the previous section. According to this exercise, the descriptions, the coverage gaps and the implementation issues of the existing social security schemes for each of the national social protection floor listed above have been pointed out. The ABND aims at providing recommendations for the further design and implementation of social protection provisions.

The Mongolian society will age considerably in the coming years. Currently, 170,000 people, or 6 per cent of the total population, are aged 60 and over, and the elderly are expected to increase to more than 900,000 or around 20 per cent of the population in 50 years. In the face of steady future aging, a pension reform should be carried out in order to secure adequate old age benefits for current and future Mongolian citizens.

The current Mongolian pension system is universal in a sense that those who do not receive a social insurance pension receive a tax-based welfare pension. An introduction of a universal pension will simplify the coordination between schemes and lead to a rationalization of the overall pension system. A universal pension can also simplify the transition process of the pension system.

The following projections illustrate the order of the cost of universal pension. The universal pension can be provided to all people over a certain age, for example, pensionable age of 55 for females or 60 for males, or 60 and 65 respectively. By having a three-tier system, people would receive a universal pension as well as benefits from other sources such as the social insurance scheme and private pension plans. A universal pension is a way to provide basic income regardless of individual careers to all residents. A universal pension reduces the risk of a low retirement pension due to frequent and long-time unemployment during one's career. The following table shows the order of the cost of providing universal pensions according to different scenarios:

- Scenario 1: Universal pension provided to all people that are above pensionable ages, namely 60 for males and 55 for females. The monthly pension amount in 2013 is set at MNT115,000 adjusted annually in line with inflation;
- Scenario 2: Universal pension provided to all people age 60 and over. The monthly amount in 2013 is MNT115,000 adjusted annually in line with inflation;
- Scenario 3: Universal pension provided to all people age 65 and over. The monthly amount in 2013 is MNT115,000 adjusted annually in line with inflation;
- Scenario 4: Universal pension provided to all people that are above pensionable ages, namely 60 for males and 55 for females. The monthly amount in 2013 is MNT115,000 adjusted annually in line with salary increase;
- Scenario 5: Universal pension provided to all people age 60 and over. The monthly amount in 2013 is MNT115,000 adjusted annually in line with salary increase; and
- Scenario 6: Universal pension provided to all people age 65 and over. The monthly amount in 2013 is MNT115,000 adjusted annually in line with salary increase.

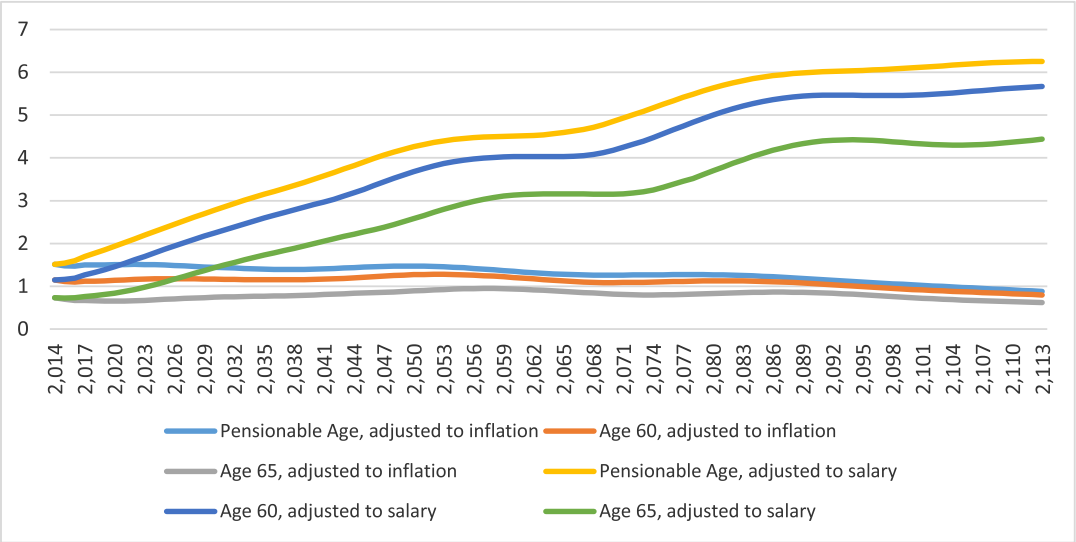
The cost of a universal pension ranges between 0.7 and 1.7 per cent of GDP in 2014 and between 0.9 and 4.4 per cent in fifty years.

The current minimum pension in the social insurance system can be abolished after an introduction of a tax-based universal pension. By eliminating the current minimum pension, the cost of the current social insurance system will decrease by about 2.8 per cent of the GDP in 2095.

Mongolia's Human Development Fund (HDF) could be a valuable tool for provisions of at least a part of a universal pension.

[5] *Cambodia, Indonesia, Thailand, and Viet Nam*

Figure 2.2 Cost of providing universal pension at the level of the welfare pension of 2014 in per cent of GDP

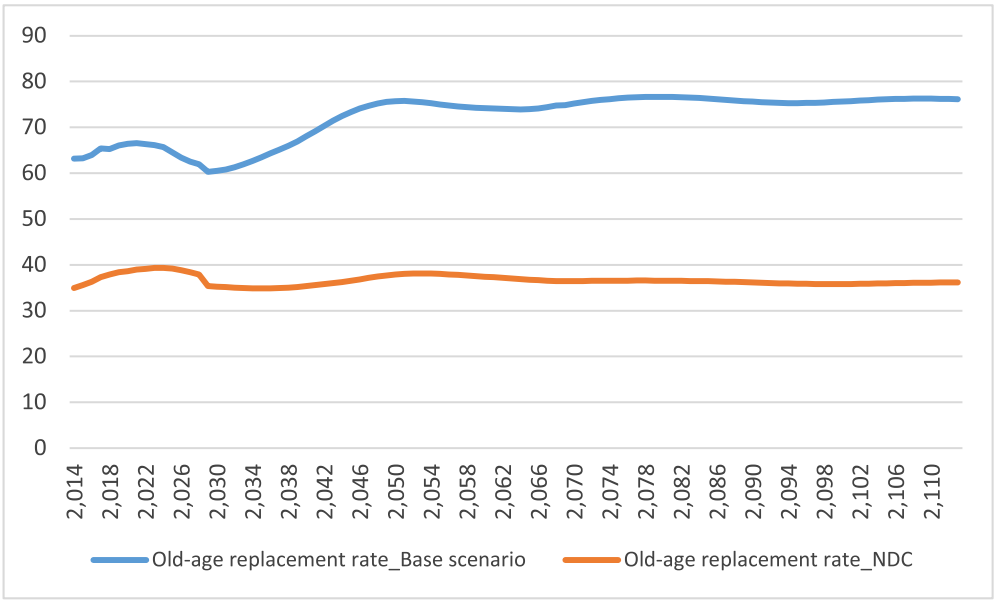


2.4 Notional defined contribution (NDC) scheme

It should be noted that the reduction of pension level as well as the increase of retirement age will lead to better financial sustainability, regardless of the reform of the parameters of the current system or an introduction of the new NDC system. This implies a lower replacement and/or a later retirement age of new retirees than the one of the current generation.

The following graph compares the system income replacement rate of the current DB system and the NDC system for new pensioners. The NDC system replacement rate is calculated with the assumptions of a contribution rate of 14 per cent and the annuity factor of the life expectancy at the retirement age.

Figure 2.3 Comparison of new pensioners' system replacement ratio, current DB pension and NDC pension



BOX 2

Equivalence between a DB pension scheme and an NDC pension scheme

DB formula

$$Pension_{DB} = Final\_Salary \text{ x } Accrual\_rate \text{ x } Number\_Years$$

NDC formula

$$Pension_{NDC} = Contribution\_rate \text{ x } \frac{\sum Salary_t \text{ x } (1 + i_s)^t}{Annuity\_factor}$$

In case the following assumption holds:

$$\sum Salary_t \text{ x } (1 + i_s)^t \approx Final\_Salary \text{ x } Number\_Years$$

which becomes true when the notional rate of return of the NDC scheme is set equal to the salary increase rate.

By equalizing the DB pension with the NDC pension, the following equation is obtained:

$$Accrual\_rate = \frac{Contribution\_rate}{Annuity\_factor}$$

Main features of an NDC system include followings:

- Benefits are more closely linked to contributions;
- The level of the benefits is automatically adjusted by taking into account the increase in the life expectancy at the retirement age;
- As people in general do not understand how substantially their pension will be reduced by the new NDC system, there could be less resistance in the introduction of the new NDC system than modifications to the parameters of the existing DB system.

Most of reform outcomes of an introduction of a NDC system can be achieved by reforms of a DB system. For example, new pensions in payment can be reduced in line with the increase in the life expectancy at the retirement age. DB pension can be calculated by using the revalorized career average[6] instead of using the last five–year average. The adoption of the revalorized career average salary will lead to a more direct link between benefits and salaries.

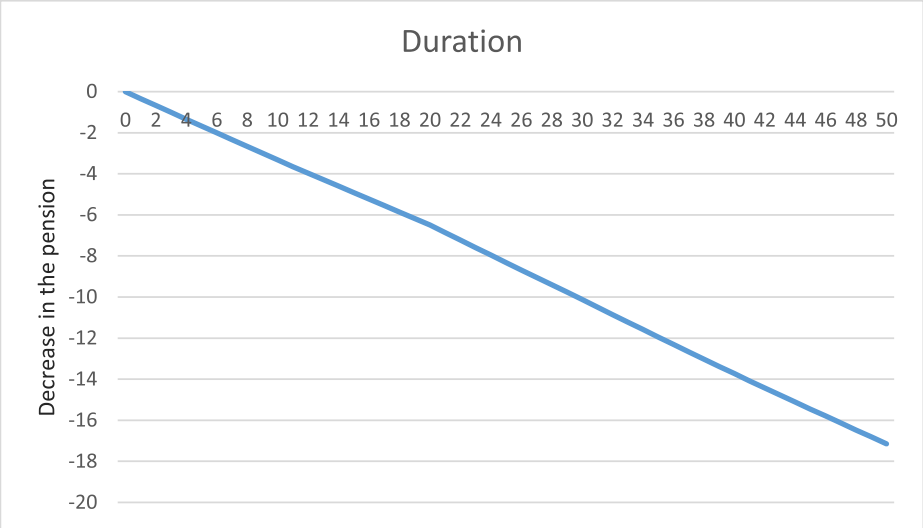
It is possible to design a NDC scheme similar to a DB scheme in terms of benefit level and vice versa by defining different type of parameters, namely:

- Annual accrual rate of the DB scheme;
- Reference salary for the pension calculation of the DB scheme;
- Contribution rate of the NDC scheme; and
- Annuity factor of the NDC scheme calculated by using mortality rates as well as the rate of return on investment;

The following box explains the relations between an annual accrual rate of a DB scheme and a contribution rate and an annuity factor of the NDC scheme in order to achieve the same benefit level for new pensioners of the DB and NDC schemes.

[6] *The pension is calculated by using the average of the revalorized salaries throughout the whole working life of the members. The past salaries are revalorized in line with the average salary increase from the moment they have been earned to the times of retirement.*

Figure 2.4 Effect of the increase of the life expectancy on the income replacement level of pension benefits



The preceding box shows an equation to achieve the same benefit levels for new pensioners of a DB scheme and an NDC scheme. The annuity factor of an NDC scheme depends on the discount rate as well as the life expectancy at the time of retirement:

A. An increase in the life expectancy at retirement will increase the annuity factor and hence decrease the accrual rate. The income replacement will automatically decrease in future. The following figure shows the impact of the increasing life expectancy on the annuity factor. The income replacement level will decrease by 20 per cent in 50 years. In other words, if current new retirees get 40 per cent of income replacement rate, those in 50 years will get only 32 per cent. To offset this income replacement reduction, there are two solutions:
   - Increasing the contribution rate, this is not assumed to take place in the NDC scheme.
   - Working over a longer period, which may lead to a situation where the level of pension will no longer be in line with the ILO Convention 102, namely the minimum replacement rate of 40 per cent with 30 years of contributions.

B. If the return used in the calculation of the annuity factor decreases (because of a lower growth in the salary or the economy, for example[7]), the annuity factor will increase, reducing thereby the accrual rate. To keep the same targeted accrual rate, the contribution rate needs to be increased, which is not assumed to take place in an NDC scheme.

C. Points A and B show that, in a NDC system, to keep the accrual rate, as the one stipulated in the convention 102, the contribution rate should be increased as in the DB system. If the contribution rate is not increased, the pension will decrease. This can lead to a situation where the ILO Convention 102 is no longer met. If the goal is to maintain a certain level of income replacement, a DB scheme with parametric reforms will be less complex.

The preceding example shows that, while both a DB system and a NDC system can be structured to provide the same level of new pensions, the level of the pensions of an NDC system will be automatically reduced so that the scheme could no longer fulfil the minimum level of pensions as stipulated in the ILO Convention 102.

As in a NDC system, an increase in the level of contributions will automatically be translated into a higher level of new benefits, the financial sustainability will hardly be achieved only by increasing the contribution rate. If there is an existing deficit caused by past pensions and contributions, it should be financed by other sources, for example, the Government budget. Automatic adjustments to the benefits play a role in maintaining the equilibrium for future benefits and this will lead to a continuously decreasing pension if the contribution period does not change and the life expectancy prolongs at the time of retirement.

[7] *The notional rate of return of the NDC system is usually set at the salary increase rate*.

The transition rules are very important when moving from one system to another. Transition rules are important to make sure that the new system is going to be implemented in an orderly manner by gradually phasing in a new system and without suddenly reducing benefits for new retirees. For example, it is important to make sure that those close to the retirement age do not see drastic decrease of their expected income replacement rate. A transition measure may include a gradual implementation of a universal pension.

In its 2010's study related to the pension reform in Mongolia,[8] the ILO has recommended the following:

- to re-establish the Individual Account scheme on an acknowledged NDC basis, financed on Pay-As-You-Go (PAYG) principles rather than pre funding requirements, together with considerations given to parametric adjustments as follows:
  - extending the coverage by means of such contribution subsidies as are needed;
  - enforcing compliance and improving the general administration through addressing a range of capacity needs;
  - increasing the IA pension level;
  - progressively raising retirement age – the starting point for which may be its alignment between women and men;
  - tightening early retirement policy; and
  - replacement (gradually) of the government subsidies by an increased contribution rate;

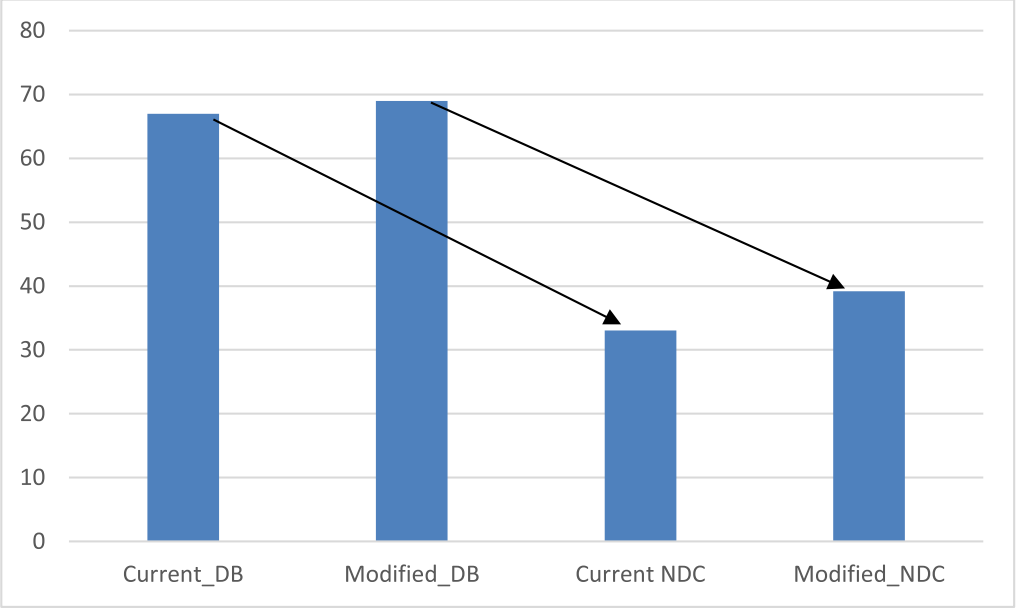
All partners agree that a third pillar system is desirable in Mongolia. The new third pillar will probably be a DC pension. It is important that the NDC scheme should be financed on Pay-As-You-Go (PAYG) principles so that financial risks are collectively safeguarded.

An increase in the retirement age and in the contribution rate will increase the level of the benefits for the coming generation of new retirees and make the system more sustainable.

It will be very important to verify that the combined pension level of the NDC scheme and the universal pension will reach an adequate income replacement level. If the universal pension is about the same level as the Welfare Pension, it should replace about 20 per cent of the average salary. This income replacement rate plus the one of the NDC scheme will provide a combined income replacement rate of about 50 per cent, which is compliant with the one recommended by the ILO Convention No. 102.

[8] *Old-age Pension Reform: A review of the 1999 pension reform for the Ministry of Social Welfare and Labour*

Figure 2.5 New pensioners' system replacement ratio, current DB, proposed DB, current NDC and proposed NDC, year 2039



2.5 Transition with an introduction of a universal pension

A simulation has been performed to compare the replacement rate for new retirees under four systems, namely:

- Current DB system;
- Proposed DB system with 2 per cent annual accrual rate, increase in the numbers of years of reference salary from five to ten years for pension calculations and increase in the retirement age;
- Current NDC system;
- Proposed NDC with 19 per cent contribution rate and increase in retirement age.

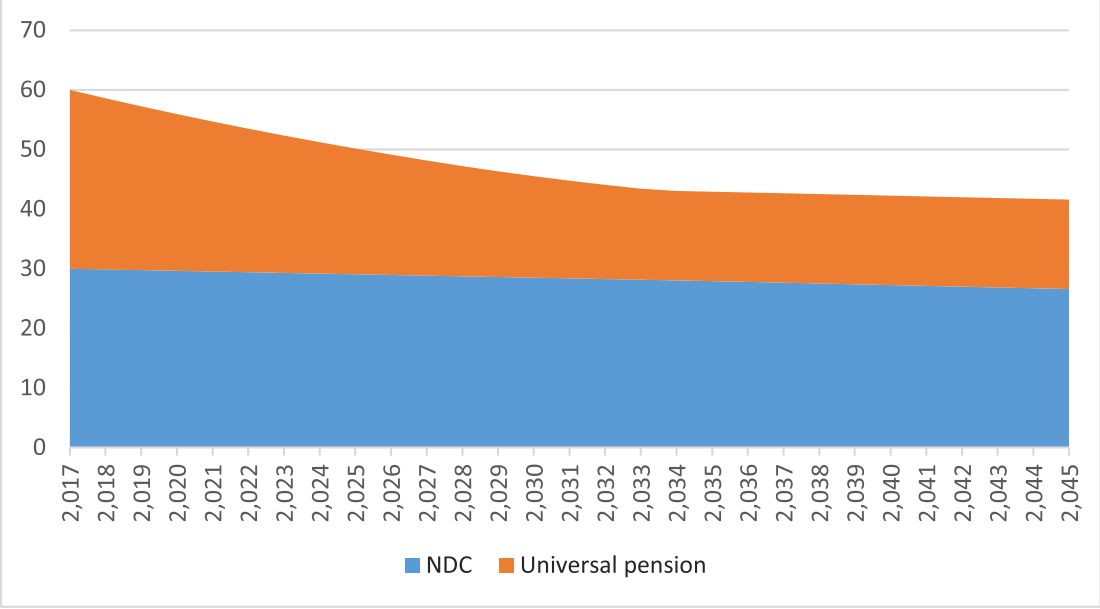
2039 is the year when those born in 1979 reach 60 years old. The current DB scheme will provide 67 per cent income replacement rate to those born before 1979 while the current DC scheme will provide 33 per cent to those born in 1979. With the new proposal, the modified new DB will provide 69 per cent income replacement rate while the modified NDC system will provide 39 per cent. The real accrual rate of at least 2 per cent for the modified DB plan will lead to higher pensions than the ones under the current DB plan. It is important to design a combined pension system to avoid a drastic change in the income replacement rate and an introduction of the universal pension, or a minimum pension, is necessary.

Figure 2.5 also raises some questions:

- Why not go directly to the implementation of the NDC combined with a universal pension instead of going through modifications of the parameters of the DB scheme and then going through the implementation of NDC combined with a universal pension.
- Why not keep a DB system and gradually modifying the parameters to reach a more optimal and sustainable NDC system?

It is important to preserve the equity between next generations of new retirees and to move at a reasonable pace to a more sustainable system. Financial sustainability and stability of the pension system is also an objective. Figure 2.6 gives an example of how a phased implementation of a universal pension will provide bridging solution during a transition period and ultimately serve as a mean to achieve an ultimate income replacement level. In this example, on the implementation date, the NDC system provides 30 per cent of the average salary and the universal pension 30 per cent. By indexing the universal pension in line with inflation, its income replacement level will gradually decrease because salaries increase faster than inflation. This

Figure 2.6 Effect of combination of an NDC and a universal pension



example shows that the income replacement level of the universal pension will decrease from 30 per cent to an ultimate level of 15 per cent and remain at that level thereafter by adjusting in line with the salary increase instead of the inflation after the ultimate level of income replacement is achieved.

It is important to design and agree on a desired level of income replacement rate for each pillar of the system as explained in section 2.2.

2.6 No free lunch

It is very important to understand that there is a cost to everything when designing a pension system. The overall cost depends on the coverage, eligibility conditions and the income replacement rate of benefits regardless of the financing modalities. For example, DB, NDC, DC, fully funded or partially funded or fully funded with different modalities of risk sharing for different generations and different players (such as employers, workers, and the Government). A financial DC system requires individuals to shoulder the following risks:

- Longevity risk;
- Inflation risk;
- Asset return and interest rate risk;
- Personal risk, like situation of disability, death

The following example shows how the income replacement rates vary for different combinations of real rate of return and real salary increase. For simplicity, all other risks such as longevity, interest rate, personal risk and inflation risk are not taken into account. The following assumptions are made:

- Use of Mongolian mortality rates;
- Contribution rate of 12 per cent;
- Man working for 35 years and retiring at age 60;
- Inflation rate is 4.5 per cent;
- For simplicity, assets returns are same before and after retirement.

Table 2.2 Income replacement rate for different scenarios of real investment return and real salary increase, with a contribution rate of 12 per cent expressed in the percentage of salaries

Real return on assets (%)	Real salary increase (%)				
	1	2	3	4	5
1	21	18	15	13	12
2	28	24	20	17	15
3	38	32	27	23	20
4	51	42	35	30	25
5	69	57	47	39	33
6	93	76	62	51	43

With an annual real return on assets of 4 per cent and an annual real salary increase of 3 per cent, those who have contributed for 35 years will receive an income replacement rate of 35 per cent. However, if the real return on assets is 1 per cent, the income replacement rate is 15 per cent. This example does not deal with the timing on investment returns due to fluctuations in the financial markets. The picture can also be different taking into account the timing. There are discussions in Mongolia to put in place a financial DC scheme for herders and people in the informal sector in place of them participation in the current DB or NDC system. This will be a DC scheme where the amount of pension will depend on the performance of the financial markets. The preceding example shows that two completely different systems with different risks for the individual may coexist if the new FDC scheme is implemented.

A financial DC plan can be offered if it is part of a comprehensive pension system, as a voluntary third tier of a comprehensive system. The way each component of the system should play each role should however be discussed and well understood by the stakeholders.

2.7 The third tier

Third tier private pension schemes play an important role in providing the target society an income replacement rate. This is the case in many countries, for example, Canada, the USA, the UK, and the Netherlands. The first objective is that the target income replacement rate should be achieved. This is accomplished through the existence of strong, well-financed and sustainable public first two tiers and a safe, well-regulated and well understood third tier. In the Netherlands, private pension DB plans are playing a more important role in the income replacement than in Canada but the financing rules are more stringent and increasing the probability to reach the objectives.

While there are some similarities, financing and administrative rules for private pension plans are very different from the one that applies to a social security pension plan. Risks that members and employers face and bear are very different. While private DB pension schemes need strong financing rules that are not necessary for private DC schemes, in both types of schemes, an exhaustive legal framework and a well-managed and efficient regulatory authority for the supervisions are required.

Although it is out of the scope of the report to put in place concrete and specific legislative framework, it should be stressed that an implementation of a well-defined legal and supervised framework are essential for private pension schemes.

2.8 Redemption of missed contributions

The Law on Recognition of the Past Services and Redemption of the Pension Insurance Contributions provides for the redemption of missing contributions during the period from 1995 to 2000. Such measure was established to compensate for the lack of awareness on the contributory scheme when it was launched, therefore causing low participation rate to the scheme. In 2014, the Parliament discussed the extension of the application of the same measure to the period between 2000 to 2014, for herders only. The draft proposal was discussed but never approved. The ILO sees such measure as inequitable towards workers, including herders, who have regularly contributed the social insurance scheme, particularly those who contribute to the voluntary system, e.g. self-employed and herders.

2.9 Design of the second tier - a single scheme or plural schemes

It is possible to design a social security earnings related pension system with more than one scheme. For example, several schemes may be in place to cover different categories of workers with different needs, such as civil servants and workers in the private sector, self-employed workers and herders. The objective of implementing different schemes can be linked to the willingness of the government to subsidize some categories of workers.

However, putting in place more than one scheme can complicate the management of a social security system. Many workers move between different employers and hence contribute to more than one scheme if any. Recognitions and proper information exchanges between schemes will be required in order to connect and evaluate different contribution periods in different schemes for the awards and pension calculations.

There are other considerations to take into account when putting in place a new scheme where some past services have been accumulated under another scheme. If all schemes are fully funded, an amount of assets equal to the liabilities accumulated under the previous scheme is calculated and transferred to a new scheme. However, the financing system is a pure PAYG in Mongolia. So the effect and weight of the past services accumulated by the herders can be very different in a new scheme than in the previous (see also the section on the evolution of the population of herders). The financial sustainability of the new schemes should be examined by looking at the impact of past services. There were 3,156 herders who claimed old age, invalidity and survivors' pensions in 2013. 1,820 claimants of old age pensions have on average 19.3 years of services. In a study published in 2013[9] by the ILO, it is suggested that:

In seeking the way forward, a range of options, possibly quite wide, may be contemplated. A few may be suggested here, albeit that this is by no means an exhaustive list. Firstly, consideration should be given to the integration of old-age provision under the existing parallel systems of social insurance and

[9] *Mongolia, Report to the Government, Extending old-age pension to Herders, the self-employed, informal sector workers and other non-covered working group*

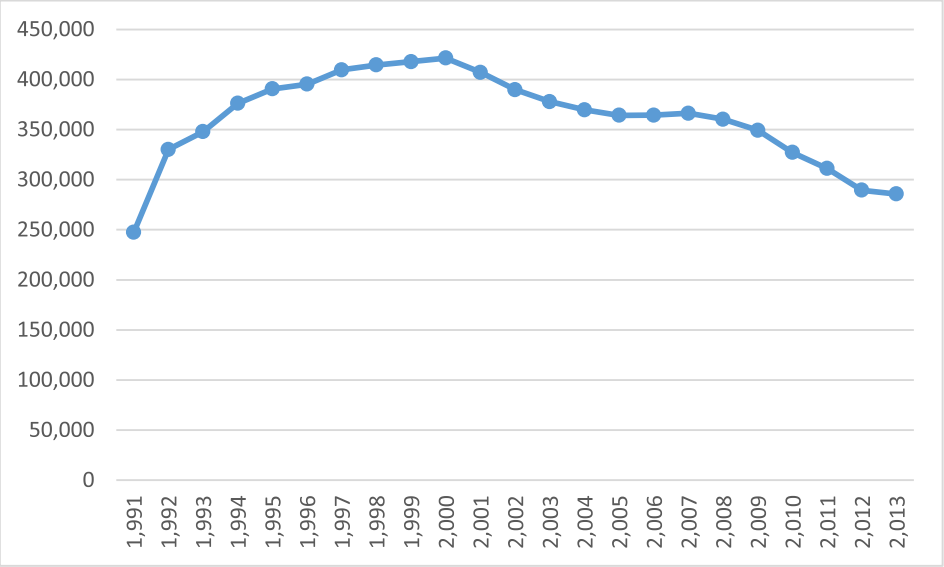
social welfare, which could result, advantageously, in the effective development of a universal old-age pension. A second option would be to enrol the herders into the general social insurance pension scheme, but to reconfigure the scheme on a multi-tier basis, within which, rather than a minimum underpin to the earnings and service-related benefit, the scheme provides a delineated basic, or "first-tier" benefit. This, in turn, would be set, initially at a modest level, which may conveniently be set in relation to the minimum wage. Two sub-options are suggested here, firstly with a basic benefit at the level of 50 per cent of the minimum wage, or alternatively at 75 per cent thereof. A third option, to be pursued if, for any one of a variety of reasons, enrolment of the herders into the existing scheme proves impractical, but not otherwise preferred, may be to inaugurate a special, "tailor-made" scheme for the herders; in each case it is envisaged that the treatment of the self-employed and informal workers' groups will be accorded similar treatment.

It is recommended to establish one scheme for administrative simplicity as well as concerns on financial sustainability of industry based schemes where future contributors are expected to substantially decrease, for example a special scheme for herders and self-employed workers. The analysis in the following section shows that it will be risky to create a separate scheme for herders.

2.10 Financial sustainability of social insurance pension for herders

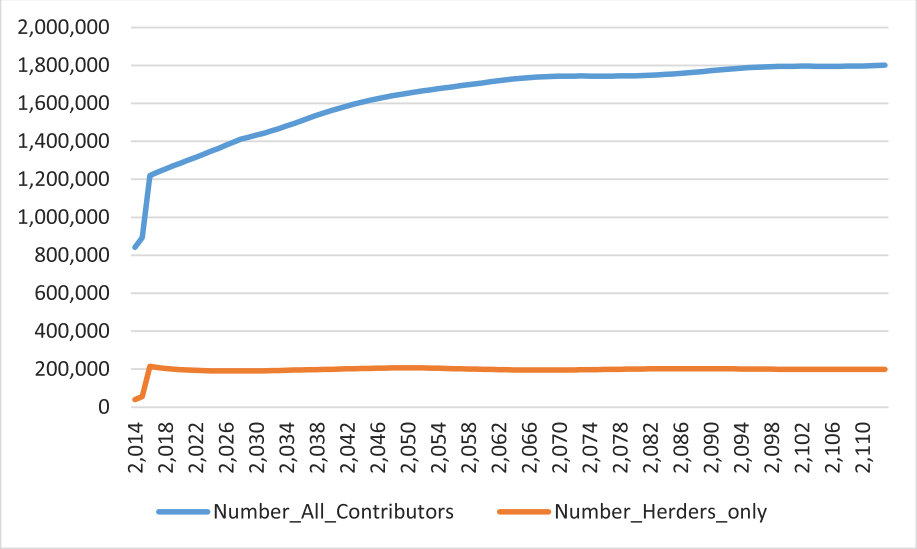
The population of herders is decreasing and is expected to continue to decrease in the future. From the viewpoint of financial sustainability, it is not recommended to launch a separate pension scheme for a decreasing population. Pensions will become burdensome for decreasing contributors. A pure PAYG mechanism cannot bear the cost when contributors decrease unless the deficits are borne by the government.

Figure 2.7 Number of herders, 1991-2013



A simulation of the current DB system for herders has been performed. It has been assumed that in 2016, the pension system in Mongolia will become mandatory for everyone in 2016. The total number of contributors of 842,000 at the beginning of the projection will increase to 1,765,000 seventy five years later. The number of herders will increase from 40,000 to 202,000 respectively, but the increase mostly comes only at the beginning, namely in 2016. The absence of growth or even the decrease of contributors should be managed.

Figure 2.8 Simulation: the number of contributors, all contributors and herders only



A fully funded scheme can cope with the problem of decreasing contributors. However, members of a fully funded scheme will face other risks such as investment risks as mentioned in the previous sections.

It is recommended to insure herders and others contributors in one scheme for financial stability, risk pooliary as well as administrative simplicity.

2.11 Flexibility is needed

Previous discussions mention that herders, self-employed and informal economy workers, need flexibility in the payment of their contributions. Herders' earnings are especially less stable than those of salaried workers and herders receive their income less frequently, namely twice a year in May for the cashmere and in December for the meat. A system that accepts one or two contribution payments per year was introduced in January 2015. It would be important to evaluate whether this arrangement had a positive impact on the regularity of contributions by herders. It would be relevant also to assess if this arrangement would be relevant for self-employed and informal economy workers. As earnings of herders can also vary from year to year, it is necessary to think of a special provision recognizing this special feature of herders.

2.12 Funding system

The current financing system is a pure PAYG system in which the government finances the annual deficits. There is a will to move to a partially funded system in the future. A partially funded system has the advantage of diversifying the risk. However, moving to a partially funded system would require contributors to pay for the current benefits as well as for additional funding and/or reduce benefits.

A separate fund for the decreasing herders and self-employed workers, if chosen, would require a fully funded system in order that decreasing future contributors should avoid excessive cost. However, risks still remain, for example, the performance of the investments, the level of the interest rate and the age composition of the group. If such a funding mechanism is chosen, an investment policy with low risk should be adopted.

The way to manage the risk will be similar to that of a private pension scheme than that of a social security system under a partial funding system. Few social security schemes have chosen to finance the plan on a fully funded basis. The consequence of opting for full funding is that an adequate provision should be set aside to finance the benefits that have been promised. It also implies putting in place a mechanism to amortize surplus or deficit.

A fully funded scheme for a closed group of existing members requires a significant amount of reserves set aside for investment income to be earned. An investment policy becomes essential for the financial governance of the scheme. When assets are less than liabilities, the investment income needs to be higher to cover the greater liabilities.

Whatever the approach retained − full funding or partial funding − it is important to adopt clear rules regarding the funding.

There are currently no formal financing objectives for the financing of the social security system in Mongolia and the following questions cannot be answered: For which period should the contribution rate be adequate? What is the desired level of reserve to expenditure ratio or funding? What is the targeted funding ratio? Is a stable contribution rate desirable to maintain equity among generations? What happens if experience is worse than expected? Who shares the risk of the scheme?

Some countries are aware of these problems and include explicit financing objectives in their funding strategy. Some also try to put in place automatic adjustment provisions to take into account future changes in demography and/or the economy.

One way to deal with financing problems is to put in place a funding policy. In the area of pension schemes, there is growing interest in funding policies, as many major pension schemes already have one in place. A funding policy is a useful tool to:

- formalize the long-term funding objectives of the scheme;
- better understand the risks and advantages of financing options;
- ensure that plan assets are sufficient to deliver the promised benefits; and
- Enhance corporate governance by increasing transparency.

Funding rules must address the interests of stakeholders:

- Current and former scheme members, as beneficiaries and contributors of the system;
- employers, as one of the parties to finance the pension system; and
- The general public and the government.

The funding policy would specify:

1. Contribution rates
2. Risks faced by the scheme and how these risks can be managed
3. Risk tolerance
4. Allocation of risks among participants and employers
5. Funding objectives (such as contribution stability or improving the RER ratio)
6. Frequency of actuarial valuation and the method of actuarial projection
7. Funding method
8. Goals related to intergenerational equity
9. All other funding issues

It is recommended that discussions should take place among stakeholders on an implementation of an explicit written funding policy, well planned and periodically reviewed in the future.

3 ANALYSIS OF A SOCIAL INSURANCE PENSION DESIGN FOR THE HERDERS AND SELF-EMPLOYED PERSONS

The design of a scheme for herders and the self-employed should take into account and should integrate the entire pension system's vision. Features in the draft State pension reform policy for 2015 to 2030 will affect the design of a scheme for herders and self-employed and informal economy workers. The most important ones are:

- Introduction of a basic universal pension;
- Gradual increase of pensionable ages to 60 for women and 62 for men by 2027;
- Equalization of the pensionable age for men and women will be considered after 2030;
- Minimal accrual rate that should not be less than 2 per cent; and
- Minimum pension.

3.1 Integration of herders to the general scheme

Instead of creating a different scheme for herders, and low income self-employed and informal economy workers, the simplest way is to include them in the general scheme. Many of low income workers contribute on the minimum wage and there is no obligation for these categories of workers, especially herders, to contribute on a monthly basis. It is possible to allow herders to contribute once or twice a year and to give some flexibility in the amount of salary declared each year. It should be noted that this kind of flexibility should not be allowed in case there is a high risk of abuses, for example, in the case of pension calculated on the last five years' salary. This flexibility is provided only when the pension is calculated on the whole past wages, for example, a DB career indexed pension scheme. It is important to avoid situations where people can increase their salary at the end of their career to substantially increase the level of pension through manipulations.

A common social security scheme for all workers is the simplest and the most logical design:

- Nothing justifies the creation of a separate scheme for herders, self-employed and informal sector workers, except the existence of a subsidy from the government. The willingness for providing the subsidy comes from the recognition that these people can be part of the most economically vulnerable workers.
- Although some people feel that the life expectancy of herders is lower than the one of other Mongolians, no studies exist to show the differences. Even though it may be the case, a design with different levels of subsidies can take care of it.
- Following elements should apply to all, including herders, self-employed and informal economy workers:
  - Introduction of a basic universal pension;
  - Minimal annual accrual rate that should not be less than 2 per cent;
  - The reference period of wage for the calculation of pension benefit will be extended from five to ten years between 2020 and 2025 (except if there are features in the design that required a different reference period); and
  - Minimum pension.

In the draft State pension reform policy for 2015 to 2030, the will of establishing a third tier pension was stated. The third tier pension can cater for differences between different categories of workers. For example, in the mining industry, employers can put in place pension scheme with early retirement features that better fit their needs. There is nothing that prevents the implementation of top-up sector-wise pension schemes in addition to a universal pension and the social insurance pension scheme. A top-up defined contribution scheme for herders can be implemented. This plan can be used to accumulate money to finance an early retirement, for instance. With a strong framework, law and supervising authorities, this plan can also help the economic development of the country through a development of a better financial market.

Maintaining a single social security pension plan for all the workers is also a way to avoid dealing with these elements:

- Recognition of the past liabilities on the implementation of the scheme;
- Recognition of past services in each scheme at the moment of the contingencies;
- The existence of undesired and unsustainable

risks for this category of workers, for example, financial sustainability risk caused by continuously decreasing herders in the future. This is a risk that should be borne by all the players in the society, not only by the herders.

Main suggestions are summarized as follows:

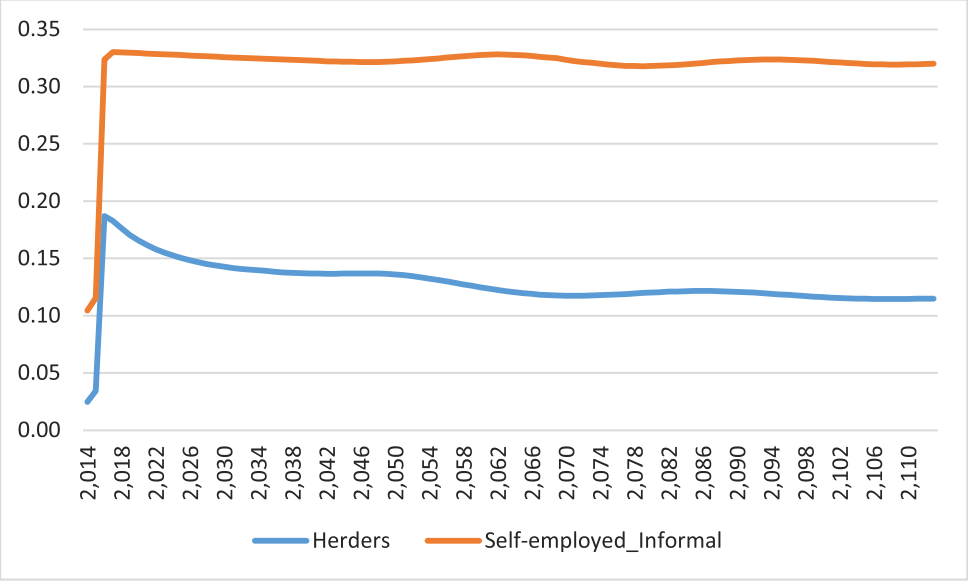
1. Mandatory participation of herders, self-employed and the informal economy workers;
   - It has been explained in this document that voluntary pension system has never achieved substantial coverage or adequate benefit provisions. The best way to achieve an adequate income replacement for a substantial part of the population is through an establishment of a mandatory system;
2. Subsidization for these categories;
   - The next section shows the cost of subsidizing the herders and other categories of workers.
3. Possibility to pay the contribution once or twice a year;
   - Contribution flexibility for herders is a very important criterion for success of the scheme.
4. The salary on which the contribution is levied can be the minimum salary as it is the case presently;
   - It can also be possible to give flexibility in the amount of pensionable salary that will be declared each year. For example, herders can choose to declare their salary each year according to a proportion of the minimum salary, such as 50 per cent, 75 per cent, 100 per cent, 125 per cent and 150 per cent. In order to allow for choices of salaries, instead of calculating pensions based on a five or ten years average, it is recommended to calculate by using the career average revalorized salary of an individual. The revalorized salary refers to the salary earned in a given year be increased in line with the average salary increase from the year it has been earned to the retirement year.

3.2 The cost of subsidizing herders and the self-employed

The government will fully subsidize the contributions of herders and maybe low income self-employed and informal economy workers. The following figure illustrates the cost in relation to GDP by subsidizing a 10 per cent contribution rate for herders and the one separately by subsidising all self-employed and informal economy workers. The calculations are carried out on the assumption that the system will become mandatory for all workers in 2016 and that those herders and self-employed workers declare the minimum salary. Fully subsidizing the contribution of 10 per cent of the salary for herders is estimated to cost between 0.3 and 0.35 per cent of the GDP.

No simulation has been performed specifically for low income self-employed and informal economy workers as neither definition nor data of these low income earners were available.

Figure 3.1 Cost of subsidizing a contribution rate of 10 per cent, herders and self-employed workers, expressed in percentage of GDP



3.3 Creation of a separate fund for herders and self-employed workers

In case there is still a will to offer a separate scheme for herders, following conditions should be at least met:

1. The scheme should be mandatory.
2. The scheme should be subsidized.
3. Does not make herders and low income earners bear more risks than the rest of the population (see section 2.6).
4. A flexible mechanism in the contributions payment should be implemented.
5. A decision should be taken in regard to past years of service accumulated before the creation of the new scheme. Decisions include: whether the amount of benefit related to these years of services is paid by the new scheme or by the previous one? If it is paid by the new one, what are the calculations of accrued liabilities and who is responsible for their payment?
6. Years of service accumulated in the general scheme and NDC contributions accumulated with notional interests should be credited to the herders and taken into account for eligibility conditions of disability and survivors' pension. Years of service accumulated in the herders' scheme should also be recognized in the general scheme. All the number of years of service shall be taken into account to calculate the eligibility and the benefit.
7. Use as much as possible, the same design for the general scheme and the one for herders. There will be many cases where people will work in many economic sectors. Too many and substantially different pension formula will make it difficult for people to have an idea of their expected retirement income.
8. The contribution rate for herders and other low income workers should bear a close relationship to the one for the general scheme. The one of the general scheme will be 19 per cent. Herders should see that their contribution rates are subsidized when compared to the one that applies in the general scheme. It has been shown in the present report that, due to the expected decrease of herders, contribution rate of a herders' scheme can be very high in the future. This means that all additional contributions, in excess of the one paid by herders, should come from the Government.
9. The administration of the herders' scheme should be done by SIGO. It is important that information contained in one scheme should be available to the other in a timely manner when it will be the time to compute the benefits. It is recommended that the claim request should be made to the last scheme he/she has contributed.
10. It is important to choose a funding strategy to minimize the risk. It is important to have in mind that in all cases, there will be a need to manage the risks. For a population that is declining, a fully funded basis is more adequate than a PAYG scheme.

4 PROPOSED DESIGNS

A design of a three-tier system is presented in this section. It is important to note that parameters of each system can be changed based on discussions between stakeholders. The parameters can be modified in the future based on experiences. The system is constructed with a universal pension as the first tier and a DB social insurance pension scheme as the second tier. Instead of having a first pillar financed separately, it has been discussed that, those who contribute to the second pillar should be also responsible for financing their first tier. In other words, those who contribute to the second tier also pay contributions to the first tier. In the section dealing with the second tier, the cost of each tier will be shown separately. The third tier is constructed on a financial defined contribution (FDC) scheme, a DC scheme plan where the amount of income on retirement is based on the contributions and the investment returns thereon.

In all simulations, a transition period of 20 years is assumed to phase in the new system. For example, for the first year, the pension is a mix of 95 per cent of the amount calculated under the current system and of 5 per cent on the proposed new system as illustrated in the following table.

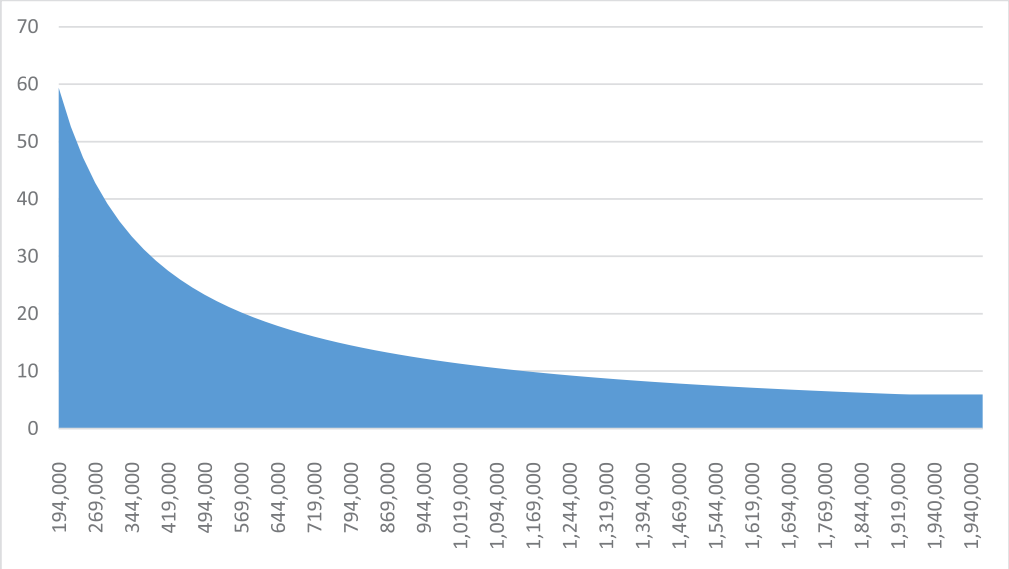
Table 4.1 Transition period, proportion of the current system's pension amount and proposed new system's pension amount in the calculation of the pension

Years	Current system (%)	Proposed system (%)
1	95	5
2	90	10
3	85	15
....		
18	10	90
19	5	95
20	0	100

4.1 The first tier

The first tier is a universal pension. The amount of the Social Welfare pension is used. The monthly amount was MNT115,000 in 2013 and MNT126,000 in 2015. The amount for new pensioners is assumed in the future by indexing annually the amount in line with the average salary increase in order to maintain the income replacement level. Once the pension is paid, it is indexed annually in line with the inflation in order to maintain the purchasing power during retirement. The following figure shows the income replacement rate of the universal pension for different levels of salary, based on the 2013 information.

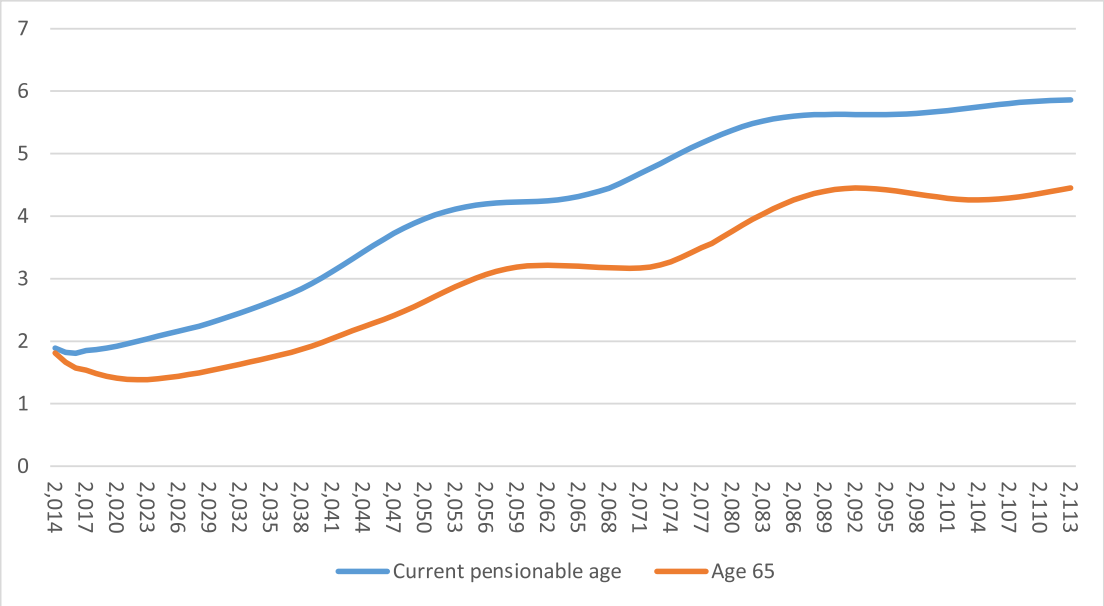
Figure 4.1 Income replacement rate of the universal pension for different monthly salaries in 2013, expressed in percentage of salaries



The income replacement rate for those with the average salary of MNT744,000 in 2013 is about 15 per cent. For those with the reference salary, defined as 125 per cent of the average salary, the income replacement rate is 12 per cent.

The following figure shows the evolution of the cost of the universal pension as a percentage of the GDP, according to the current retirement age of 55 years old for women and 60 years old for men, and according to the retirement age of 65. The graph clearly illustrates that the retirement age has a major impact on the cost of the universal pension. In the very long run, the cost for the current retirement age is estimated at 5.9 per cent of GDP while the cost for the retirement age of 65 is estimated at 4.4 per cent of GDP, a difference of 1.5 per cent of GDP.

Figure 4.2 Cost of universal pension for all people in Mongolia expressed as a percentage of the GDP



4.2 The second tier

The second tier is mandatory social insurance pension for all formal and informal economy workers.

4.2.1 The second tier as the DB pension scheme

The proposed design for the second pillar is a DB pension scheme with an annual accrual rate of 0.95 per cent by year of service.[10] This accrual rate is set at the minimum level so that the combined total income replacement rate by the universal pension as well as the DB scheme is about 40 per cent for those workers with the reference salary of 125 per cent of the average salary as required by the ILO Convention 102. The pension is indexed each year in line with the inflation. This new second tier, together with the universal pension, is assumed to be phased in for a period of 20 years. The survivors' pension and the disability meet the minimum standards of the ILO Convention 102 as described in the following tables. The eligibility criteria of a minimum three years of contribution are maintained for the survivors and disability pension.

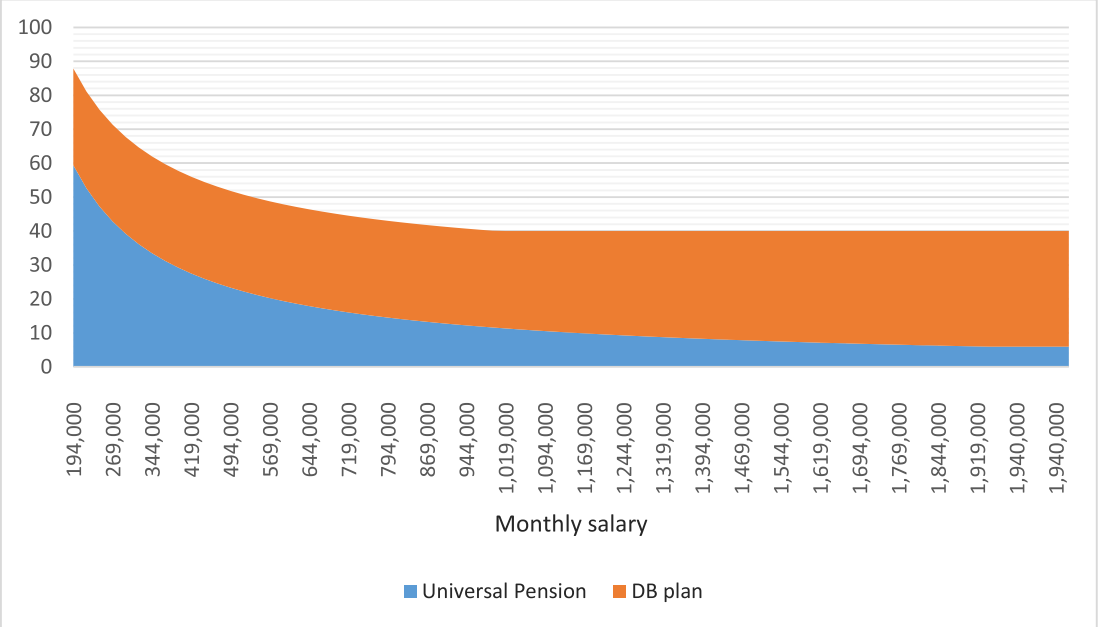
[10] *This level of annual accrual rate may change with more updated information.*

Table 4.2 Minimum standards, ILO Convention 102 for old-age, disability and survivors benefits

Type of benefits	Income replacement level (%)	Years of service for model pensions	Duration of benefits
Old age	40	30 years	Lifetime
Disability	40	15 years	Lifetime or until old age pension is paid
Survivors	40	15 years	Lifetime

Those with 30 years' contributions will get the income replacement rate of 28.5 per cent from the DB scheme. The next figure shows the income replacement rate combined and separately for the universal pension and the DB pension. If someone has contributed to the scheme for a period over 30 years, the income replacement rate will be more than the minimum required level of 40 per cent in the ILO Convention 102.

Figure 4.3 Income replacement rate for those who contribute for 30 years, combined as well as separately for universal pension and DB pension scheme, expressed as percentage of wages



It is important to note that, unlike the current eligibility condition, no minimum contribution requirement for old age pensions is assumed under the proposed design. Any person who has contributed at least one month to the scheme is eligible for old age pension. The following figure shows the total income replacement rate under the proposed system for a different number of contributing years.

Figure 4.7 shows the cost of the proposed system. The cost of both the universal pension and the DB scheme is financed by contributors to the scheme. At the end of the section, the cost of the universal pension is going to be shown separately. It is also important to note that this report does not constitute an actuarial analysis of the current system in Mongolia as data needed to produce an actuarial valuation were not available. However, information is available to estimate the cost magnitude of the proposals.

Demographic projections show the future development of demographic ratios, defined as the ratios of pensioners to contributors, for old age, invalidity and survivors' pensioners (See figure 4.5.). The total number of contributors is increased

in line with the increase of employed population. The number of pensioners will grow rapidly during the projection period since the scheme is not yet mature. There is a big drop in the demographic ratio at the beginning of the projection period because of the assumption that the new system becomes mandatory starting in 2016 and all the herders as well as self-employed join the scheme on 01 January 2016. The overall demographic ratio of all pensioners, including old age, disability and survivors' pensioners, to contributors grows from 38 per cent in 2014 to 94 per cent in 2113. The ratio of pensioners to contributors is normally a good indicator of the increasing cost of the scheme due to aging of the population. This directly affects the PAYG cost of the scheme, as presented in this section.

Figure 4.4 Total income replacement rate for different contributing years, universal pension and DB pension plan combined, expressed as the percentage of wages

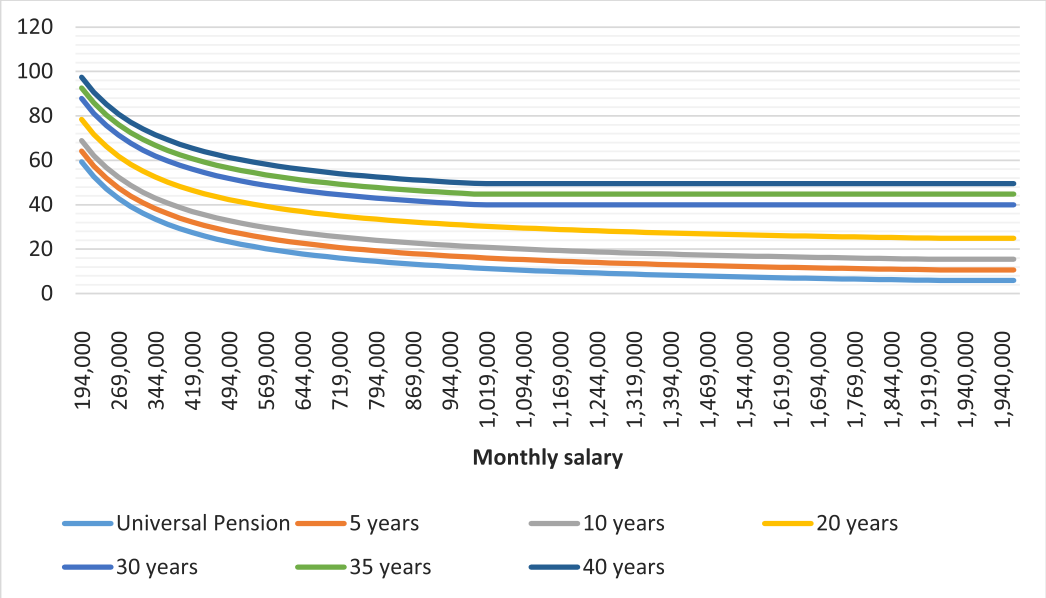


Figure 4.5 Demographic ratios by benefit type, 2014–2113 (expressed as percentage)

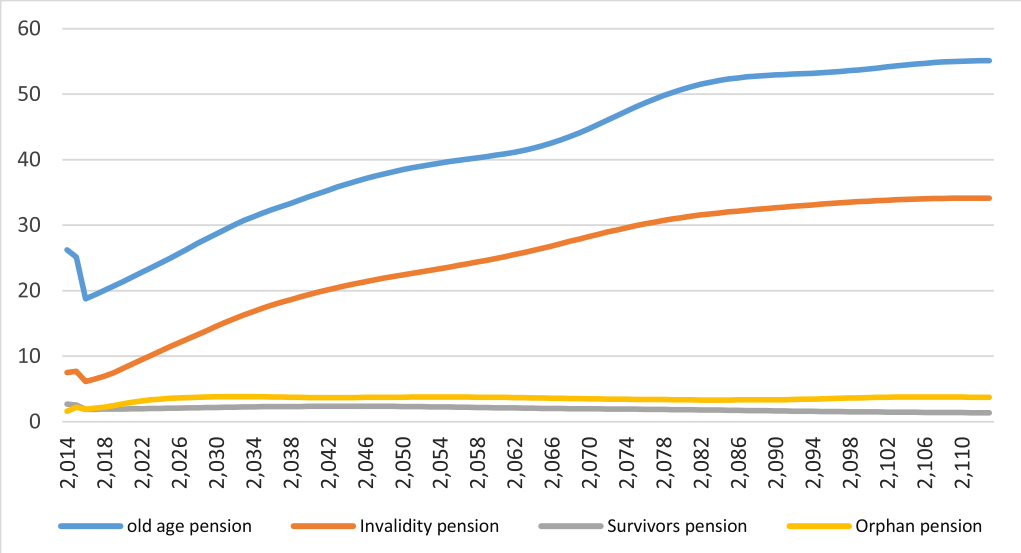


Figure 4.6 shows the evolution of the replacement ratio, defined as the average pension of pensioners over the average salary of active members by benefit type. The trend is downward at the beginning of the projection and is expected to increase thereafter.

Figure 4.6 Replacement ratios by benefit type, 2014−2113 (by percentage)

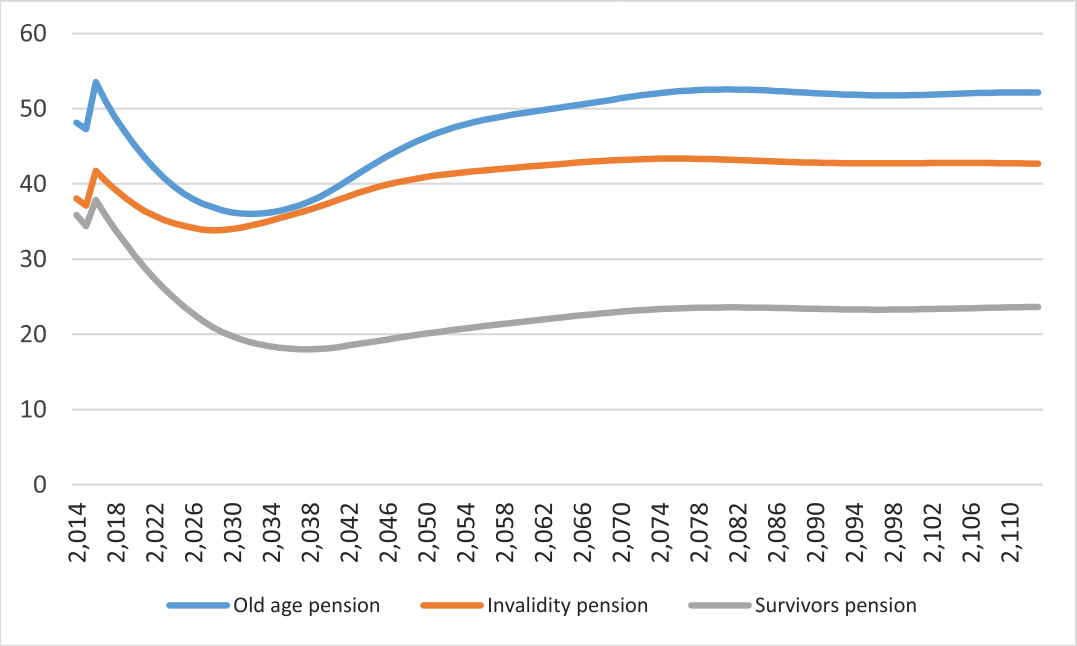
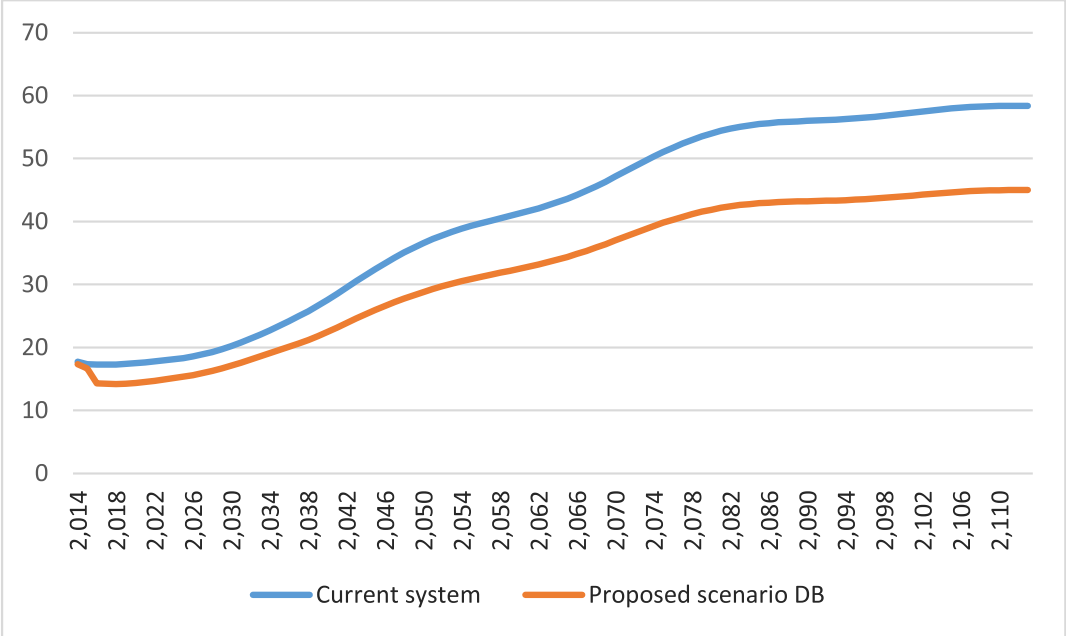


Figure 4.7 Projected pay-as-you-go (PAYG) cost rates, 2014−2113 (expressed as percentages of salaries)



As shown in figure 4.7, the total expenditures as a percentage of insurable earnings, called the pay-as-you-go (PAYG) cost rate, will increase from 17.3 per cent in 2014 to 45 per cent in 2113. The PAYG rate represents the contribution rate that would be required to pay all the expenditures of the scheme, including benefits, administrative and other expenses, annually, in the absence of reserves. This substantial increase of the PAYG rate is mainly due to the increase of the demographic ratio as explained in the previous section. The increase of pensioners will be much faster than that of contributors. The figure also compares the PAYG cost under the current optional system for herders and the informal sector and the proposed mandatory system. The impact of switching from an optional system to a mandatory system takes place at the beginning of the projection.

Table 4.3 shows the results of the financial projections for cash flows and reserves of the proposed DB scheme. The contribution rate for the pension branch is assumed at 19 per cent. The main observations are as follows:

1. Annual contributions are sufficient to pay for all annual expenditures (benefits and administrative expenditures) until 2033. The reserve grows rapidly.
2. Starting in 2034, investment income must be used to pay for annual expenditures. The reserve still grows, but at a slower pace. 2034 is the year when the PAYG cost rate exceeds the current contribution rate.
3. Starting in 2040, total income, including contributions, investment income and other income, is no longer sufficient to pay for annual expenditures. The reserve starts to decrease.
4. During the year 2048, the reserve drops to zero.
5. Starting in 2048, the required annual contribution rate to pay for all expenditures becomes the PAYG cost rate. As an illustration, this rate is 27.8 in 2088 and 45 per cent in 2113.
6. The reserve ratio, which is the ratio of the end-of-year reserve over the annual expenditures for the year, will decrease to zero in 2048. This ratio can be interpreted as the number of years during which annual expenditures can be paid by the reserve if there were neither contribution, nor investment income nor other income. This ratio is also an indication of the degree of funding of a pension scheme. The higher the ratio, the higher is the funding ratio. The downward trend of this ratio also means that, if the plan is for more capitalisation of the system in the future, it will become more and more difficult to reach that objective. There will be need to pay the benefits, facing combined pressure from the increasing cost and a downward trend in the reserve. Increasing the degree of capitalisation of a system should come from a clear funding strategy at the beginning of the existence of the scheme or when important reforms are done.

It is also important to note that according to the proposed design, there is a long term deficit of about 7.6 per cent of the GDP. As shown later, strategy of cost containments such as increasing the retirement age can decrease the level of deficit.

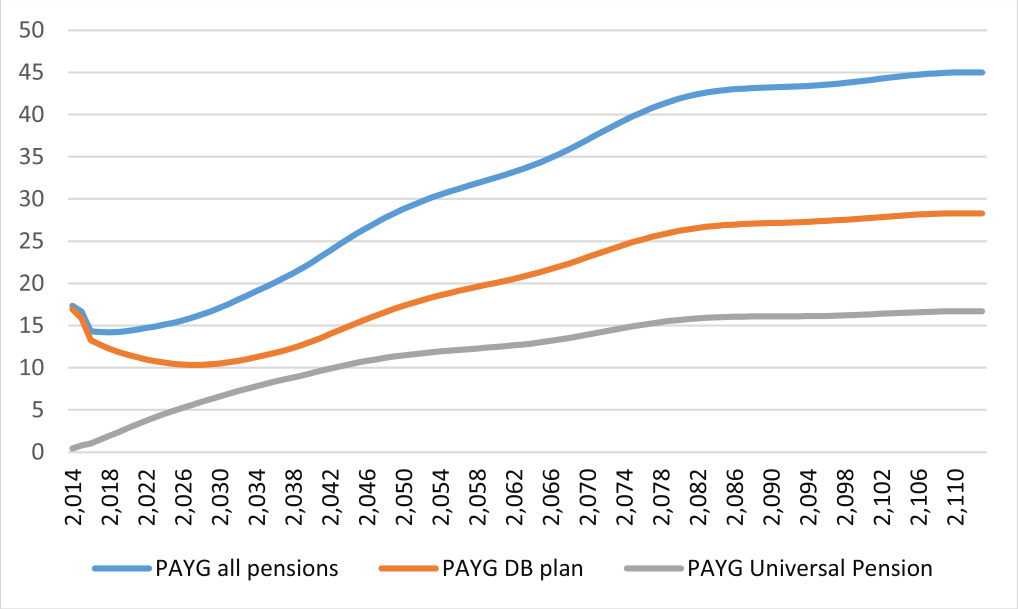
Table 4.3 Financial projections: Cash inflows, cash outflows and reserve, 2014–2113 (MNT million), contribution rate = 19%

Years	Income			Expenses		Surplus (Deficit)	Reserve (end year)	PAYG	Reserve Ratio
	Contributions	Investment Earnings	Others	Benefits	Administrative \ Expenses				
2014	980 578	6 639	10 064	869 485	25 805	91 928	101 992	17.3%	0.1
2015	1 139 405	17 102	11 694	967 986	29 984	158 537	272 223	16.6%	0.3
2016	1 483 959	40 654	15 230	1 078 019	39 052	407 543	694 995	14.3%	0.6
2017	1 674 941	81 116	17 190	1 209 189	44 077	502 791	1 214 977	14.2%	1.0
2018	1 887 960	130 444	19 376	1 359 160	49 683	609 560	1 843 913	14.2%	1.3
2019	2 125 497	189 467	21 814	1 535 500	55 934	723 531	2 589 259	14.2%	1.6
2020	2 390 378	258 729	24 533	1 743 885	62 905	842 317	3 456 109	14.4%	1.9
2021	2 685 924	338 917	27 566	1 982 330	70 682	971 830	4 455 505	14.5%	2.2
2022	3 015 961	431 016	30 953	2 254 774	79 367	1 112 836	5 599 294	14.7%	2.4
2023	3 384 996	536 176	34 741	2 563 704	89 079	1 268 389	6 902 424	14.9%	2.6
2028	5 963 415	1 242 330	61 203	4 953 588	156 932	2 095 225	16 018 528	16.3%	3.1
2033	9 565 458	2 109 179	98 172	9 086 413	251 723	2 336 502	28 044 952	17.6%	3.0
2038	14 469 120	2 724 375	148 499	15 752 266	380 766	1 060 463	37 406 988	21.2%	2.3
2043	20 410 900	2 384 665	209 480	25 867 551	537 129	-	31 338 607	24.6%	1.2
2048	28 176 492	-	289 180	40 411 312	741 487	-	-	27.8%	0.0
2053	38 623 525	-	396 399	60 210 786	1 016 409	-	-	30.1%	0.0
2058	52 739 958	-	541 279	87 047 655	1 387 894	-	-	31.9%	0.0
2063	71 757 888	-	736 463	124 830 989	1 888 365	-	-	33.6%	0.0
2068	96 940 915	-	994 920	180 409 892	2 551 077	-	-	35.9%	0.0
2073	129 946 954	-	1 333 666	261 388 055	3 419 657	-	-	38.7%	0.0
2078	173 950 203	-	1 785 278	372 368 428	4 577 637	-	-	41.2%	0.0
2083	233 768 252	-	2 399 200	518 174 009	6 151 796	-	-	42.6%	0.0
2088	315 646 619	-	3 239 531	708 314 230	8 306 490	-	-	43.1%	0.0
2093	426 765 807	-	4 379 965	962 372 815	11 230 679	-	-	43.3%	0.0
2098	574 861 518	-	5 899 895	1 308 439 148	15 127 935	-	-	43.7%	0.0
2103	770 693 251	-	7 909 747	1 780 102 780	20 281 401	-	-	44.4%	0.0
2108	1 032 185 791	-	10 593 486	2 411 471 895	27 162 784	-	-	44.9%	0.0
2113	1 386 294 883	-	14 227 763	3 246 253 701	36 481 444	-	-	45.0%	0.0

The general average premium (GAP) is another very important financial indicator. It is defined as the annual contribution, as a percentage, of insurable earnings necessary to pay for all expenditures over the entire projection period, but assuming that the initial reserve will be exhausted at the end of the period. In the current scenario, the GAP is calculated at 30.4 per cent.

The following figure shows the breakdown of the PAYG cost rate between the part of the universal pension and the one for the DB scheme. The contribution rate necessary to pay the DB scheme over the next 100 years is 19.1 per cent while the one to pay the universal pension is 11.3 per cent. The required combined contribution rate is estimated at 30.4 per cent.

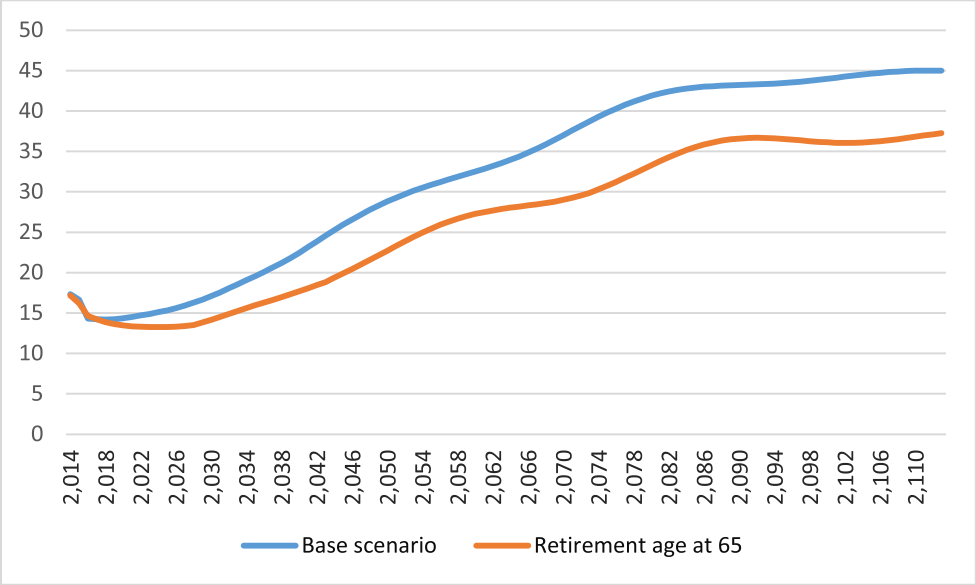
Figure 4.8 Projected pay-as-you-go cost rates, 2014−2113, all the benefits, DB scheme and universal pensions (percentages)



Appendix 5 explains more in details the different mechanisms that are used for financing a social security pension scheme.

The last figure shows the PAYG cost rate if the retirement age is increased gradually to 65 for the next 15 years for men and the next 30 years for women. Impact of the increase in retirement age is dependent on people's retirement behaviour which could be encouraged for the possibility of obtaining additional years leading to higher pensions. It is proposed to immediately discuss and to put in place a schedule of increase in the retirement age as the gradual increase takes time. The GAP contribution rate is projected to decrease from 30.4 per cent to 25.2 per cent. The deficit at the end of the projection period in terms of GDP has decreased from 7.6 per cent to 6.8 per cent.

Figure 4.9 Projected pay-as-you-go cost rates, 2014−2113, base scenario and another scenario of increasing the retirement age to 65 (percentages)



4.3 Third tier

In this section, a design of the third tier is proposed based on the concept of financial defined contribution plan (FDC). One of the objectives of the third pillar is to increase the retirement benefit for the workers.

The analysis of this tier should take into account many elements. First, the characteristics of a defined-contribution scheme need to be well understood. Unlike a defined-benefit scheme, the benefit level is not guaranteed. Contributions are accumulated in an individual account and paid when the contingencies such as retirement, disability or deaths occur. In a FDC, the individual bears a lot of risks: investment, inflation, longevity and other personal risks. It is possible to design the scheme to minimize such risks.

The main consideration is to determine if this defined contribution component should be compulsory or voluntary. It could also be compulsory with an opt-out option,[11] with or without financial obligations for the employers. Minimum contribution rates might also need to be determined. A voluntary FDC scheme is seen as a good option based on the recommendation for the mandatory first and second tiers.

[11] *Employees can opt-out from the plan, but they are automatically enrolled otherwise.*

For administrative reasons, the minimum contribution can be set, for example, at 4 per cent.

In some design of FDC schemes, the management of the account, like where to invest the money, is the participant's responsibility. Thus, the participant bears the risk of bad investment returns. Managing on an individual basis may not be the best way to optimize the system. Investment and administrative fees are so high that it could considerably affect the value of the account at the moment of retirement. People have to keep in mind that it can cost over 30 per cent more contributions over the working life to offset a 1 per cent lower return on assets because of higher fees. Good financial counselling is essential for this type of plan. It is recommended to adopt a collective management of the money to decrease the investment fees. The risk would then be shared between participants based on insurance principles. Depending on the development of the financial markets in coming years, many investment options could be offered, and a default investment option could be set for people who do not make an investment choice. It is suggested that the current social security scheme (SIGO) should be able to provide the FDC scheme. SIGO can offer at the beginning one option for the investments. A very well designed investment policy will be necessary.

Competition can also come from private sectors. For example, it can be possible to let an association of herders to contract with a private insurance company for the implementation of the FDC scheme. The business should be well supervised. All providers should comply with the same regulation and supervisory rules.

Payments are usually in a lump-sum, meaning that the longevity risk is borne by the participant. In other words, someone who retires is at risk of outliving his money due to bad management of his account or simply because he did not contribute enough during his working years. When planning their retirement income, people often underestimate their life expectancy, and any increase in life expectancy will impact them directly. This can lead to a lack of income at advanced ages. It is recommended that the account should be converted into an annuity at retirement to protect against the longevity risk. A small portion can be withdrawn as a lump sum, for example, the maximum of 10 per cent of the value of the account. The individual should be offered many choices regarding the form of the annuity. For example, the individual may choose between:

- Single annuity: the payment stops on the death of the insured;
- Survivors' annuity: a portion of the pension is payable on the death of the insured, for example at 50 per cent;
- Guaranteed period annuity: the payments are guaranteed for a minimum number of years (for example, if the guaranteed period is ten years and the insured dies during the first ten years of payment, the residual is paid to the heirs);
- Increasing annuity: Instead of having each year a level amount of annuity during the life, the level can increased by a percentage each year.

If this design is put forward, the social security scheme could pay annuities or buy annuities from an insurance company. It should be kept in mind that, if the social security scheme pays annuities, an actuarial valuation is going to be necessary, like an actuarial valuation of an insurance company, to be sure that the scheme is going to be in good financial condition to continue to pay the promise. Ways and strategies are going to be designed to pay for deficits if any.

The following are other issues that might have to be addressed:

- The first age someone can opt for the annuity should take into account the retirement age in the general scheme. If the retirement age of the general scheme is increasing in the future, the retirement age of the FDC can be a little bit lower allowing the individuals to retire earlier if they made sufficient contributions.
- Incentives, like preferred tax advantages (deduction of contributions and non-tax of the investments income), can be used to encourage people to save for retirement. It is however important to put a maximum contribution rate like 20 per cent.
- Both the individual and the employer can contribute to the scheme. It is suggested to specify the level of contributions that the employer should pay.
- Care should be taken to make sure that the money, including any employer contributions, will belong to the participants, and will be protected from any withdrawals from the employers. It will be the duty of the employer to transfer the contributions to the FDC scheme.
- In general, it is necessary to safeguard substantial portions of the saving for the retirement purpose. Therefore, there should be limitations on using savings for other purposes such as loans to buy a house for example, or premature withdrawals during time of financial hardships.
- Disclosure to participants is very important. Good information must be provided, such as periodic information statements about the money in the account and what retirement income can be expected. Information on performance of the investments, the rights of the insured persons and the summary of the provisions of the plan should also be transmitted to the insured persons. These statements should consider all the retirement income, including the pension accrued so far in the SIGO general scheme.

The efficiency of a defined contribution component will depend on the decisions made regarding the parameters described above, and these decisions depend on the objective pursued by the Government.

The following table summarizes the design:

Table 4.4 Summary of proposed parameters of the DC plan

Parameters	Comments
Voluntary	Recommendation of a voluntary scheme at the beginning. Depending of the success of the implementation, may move to an opt-out system.
Management	Collective management only to decrease the fees.
Competition	Competition from private sector allowed from Insurance company (collective management). All players should satisfy the same supervisory rule. Actuarial valuations are needed.
Contribution rates	Minimum 4% - Maximum 20%. Minimum required contribution for the employer should be established.
Responsibility of the employers	Paying his contribution and the employees contribution on due time.
Incentives	Contributions tax deductible. No tax on investment returns.
Choice of transformation of the account	Single annuity, survivor's annuity, guaranteed annuity, increasing annuity should be offered
Flexibility	10 % of the account can be paid as a lump sum on retirement.
Death	On death, the account is paid to the heirs.
Disabled	On total and permanent disability, the value of the account can be refund to the insured.
Disclosure rules are necessary	A statement of the account should be sent each year, including the performance of the investments, with a brief summary of benefits, rights and duties.
Supervision rules	Supervision rules need to be defined.

The yield on government bonds in Mongolia is quite volatile. It has oscillated between 5 and 9 per cent during the last three years. Inflation rate has also been volatile over the last years (see table A3.11). This economic context makes it difficult to implement a pension system where the money accumulated for retirement is used to buy an annuity. Because of uncertainties, the price of an annuity can be high. The reader can also refer to the section 2.6 for the discussion about the risks of DC plan. When the financial market in Mongolia will be more developed, it will probably be possible to buy annuity at decent price. The following table illustrates the value of an annuity according different kind of protection in a more stable economic environment. The following assumptions are made:

- Use of Mongolian mortality rates;
- Contribution rate of 6 per cent;
- Man working each year during for 30 years and taking his retirement at age 60;
- Inflation rate is 4.5 per cent;
- Real interest rate during the accumulation phase is 3 per cent and real interest rate on retirement is 2 per cent;

According to these assumptions, for one tugrug of annual salary today, the value of the account in 30 years is going to be MNT15.8. At that moment, the salary is going to be 8.1 times higher than today. For example, if someone has an annual salary of 3.6 million tugrug, the level of the account in 30 years is going to be about 54.7 million tugrug and the salary 29.2 million tugrug. In the following table, an annuity factor is used to buy an annuity. The income replacement rate on retirement is also shown.

Table 4.5 Income replacement rate according to different choices of annuity, 6 percent contribution rate

Scenarios	Annuity factor	Income replacement rate
Single life annuity fully indexed to inflation	18.3	10.2
Single life annuity without indexation	11.5	16.3
10 years guarantee annuity fully indexed to inflation	18.8	10.0
50% Survivor's annuity fully indexed to inflation	21.2	8.8

The income replacement rate depends on the level of the annuity. The higher it is, the lower is the income replacement rate. If the annuity factor is higher, it is because it includes an additional feature. For example, in the table above, one pays more for an annuity that is going to increase over the lifetime according to the inflation (18.3 per cent vs. 11.5 per cent) than for an annuity that gives no protection against inflation. According to the ten years guarantee feature, if someone dies during the first ten years, the annuity continues to be paid to the heirs for the remaining period. For the 50 per cent survivor's annuity, when the annuitant dies, the spouse receives 50 per cent of the pensioner's annuity for the rest of their life. All these options decrease the income replacement level on retirement but give protection for the survivors or the retirees.

5 CONCLUSION

This report analyses some propositions of the reform of the Mongolian pension system. It also presents an analysis of the implementation of a new scheme for herders and self-employed workers.

It is important to bear in mind that this report does not constitute an actuarial valuation of the current social security system in Mongolia. Some of the data needed to proceed were not available. Enough information was however available to have a good idea of the magnitude of the recommended options.

This report states that:

1. All the parameters of the proposed reform are not currently defined. The definition and the level of these parameters are going to have a considerable effect on the logic and the viability of the system. It is suggested to define all the parameters in the proposed policy to make sure that there will be consistency in the future system.
2. In the past, the transition arrangements from the DB system to the NDC system were not formulated. For the future, transition rules should be clear and based on an exhaustive road map.
3. Before proceeding to a reform, it is important to analyse and optimize all aspects of the social security scheme. It is suggested to analyse and improve the management of the disability benefits in order to reduce the financial pressure to the scheme.
4. Delaying a fundamental reform of the scheme will add more problems. An introduction of a universal pension is instrumental especially when combined with the reform of the earnings-related pension scheme.
5. It is not the switch from a DB system to a NDC system that makes the system more financially sustainable. Rationalization of the current benefits cannot be avoided. It is possible to maintain a DB system and reform the system through parametric changes with a transition period that will prevent a sudden decrease in income replacement for new retirees.
6. The document shows that it will be difficult, if not impossible, to design a NDC scheme that will comply with the principle of benefit adequacy and predictability as set out in the ILO Convention 102. The NDC scheme will automatically decrease pensions in line with the increase of the life expectancy at the time of retirement. In addition, the contribution increase, if at all it happens in the future, will automatically lead to increase in future pensions of the NDC scheme and cannot finance past liabilities of the system.
7. To make the system more sustainable, other modifications, like the increase of the retirement age, are essential.
8. A three tier system is recommended. This report puts emphasis on the need to implement a well-defined legal and supervised framework in case the third-tier private pension scheme is introduced.
9. Taking money from the redemption fund to finance the contributions of people that have not been made during the period starting in 2000 to 2014 is unfair for those who have made the decision, in the past, to contribute to the social security system, particularly those who were in the voluntary system: the self-employed and the herders and hence it is not recommended.
10. It is preferable that the herders, self-employed and informal economy workers should be part of the general scheme instead of creating a separate pension scheme for them. Better risk management through risk pooling and simplicity of a system could be achieved by integrating them in a general scheme.
11. A funding policy is needed. This is a way to have a clear road map for future financing objective of the pension system.
12. A recommendation of a three-tier system that meets the requirements of the ILO Convention 102 is included in this report.

APPENDICES

APPENDIX 1. Social security benefits

1.1 Description of the existing social security benefits and provisions in Mongolia provided under the: Law on Social Insurance and Law on Pensions and Benefits provided by the Fund of Social Insurance, 1994: DB scheme Law on Individual Pension Insurance Contribution Accounts, 1999: NDC scheme

General provisions	
Membership	DB Scheme: All workers employed in the private and public sector (except those covered by the military scheme) who are born before 1960. NDC scheme: All contract workers employed in the private and public (except those covered by the military scheme) sector born after 1959. The herders, self-employees and informal economy workers are covered on a voluntary basis.
Contributions	DB Scheme Contribution rate applied on the contributory wage: • employer contribution: 7.0 per cent • employee contribution: 7.0 per cent DC Scheme Contribution rate applied on the contributory wage: • employer contribution: 7.0 per cent • employee contribution: 7.0 per cent Contribution for herders, self-employees and informal economy workers = 10.0 per cent

General provisions	
Other incomes	The cost of the social security scheme is highly subsidized by the government which is paying around 2 per cent of GDP to pay the benefits.
Contributory salary and pensionable salary	The salary used for the calculation of contributions and for the establishment of benefits is the wage between the minimum wage and ten times the minimum wage. The monthly minimum wage in 2014 is MNT192,000.
Redemption of years of service	During the transition period of the 90's from a socialist economy to a democratic one, part of contributions was lost due to employers' incorrect declarations of their employees' wages, non-payment of contributions and unemployment caused by closures and privatization of public enterprises. To minimize the impact of this transition period two measures have been implemented: • During the five years between 1990 and 1994, the years of work for those who have not contributed to the social security system are recognized in the contributory period; • For the year 1995 to 2000 (six years) it was possible to buy back some years of service during the period starting in October 2013 and ending in August 2014. The pay back price is based on 12 per cent of the minimum wage up to a maximum of MNT78,120 of contributions for all the six years.
Taxation	Benefits are tax exempt

Provisions for old-age, non-occupational disability and death insurance benefits	
	Old-age benefits
Normal retirement age (NRA) and eligibility conditions	DB Scheme The normal retirement age is 60 for men and 55 for women subject to some early retirement rules: Eligibility conditions: • At or after the normal retirement age: the minimum number of years of contribution is 20 for men and for women. • Early retirement (before NRA): ○ 55 for men with 20 years of service, ten of which underground or in high heat. ○ 50 for women with 20 years of service, 7 years and 6 months of which in high heat. ○ 50 for women who have raised four children or more. NDC Scheme The normal retirement age is 60 for men and 55 for women subject to some early retirement rules: Eligibility conditions: • At or after the normal retirement age: the minimum number of years of contribution is 15 for men and for women. • Early retirement (before NRA): ○ Same as in the DB scheme
	Old-age benefits
Old-age pension	DB Scheme Monthly pension: First 20 years: 45 per cent x pensionable salary[1] After 20 years: 1.5 per cent x pensionable salary[1] x number of years of contribution in excess of 20 Those retiring with at least ten years of service receive a reduced pension based on a prorated basis of the pension for the first 20 years (45 per cent). • Minimum pension: at least 75 per cent of minimum wage for those entitled to the full pension and at least 50 percent of minimum wage for those entitled to a prorated reduced pension. Currently, effective amount of the minimum full pension is equal to 108 per cent of the minimum wage. [1] Calculated over the best five years' consecutive wages in the final 20 years adjusted to the wage inflation. NDC Scheme Monthly pension: Based on the Notional Account balance at a contribution rate of 14 per cent contribution with the following features: • Notional return for each year is based on the average growth in the last three years of the average wages • Used of an average life expectancy factor to convert the fund in a pension • Minimum pension: 20 per cent of the national average wage, plus an additional 0.5 per cent of the average wage for each additional service year beyond the minimum of 15 years.

	Old-age benefits
Indexation of the pension	DB Scheme According to the Law, it should be increased in "relation to changes in the cost of living". In practice, it is determined on an ad-hoc basis by the Government. DB Scheme According to the Law, it should be increased in "relation to changes in the cost of living". The modalities need to be developed.
Grant	An insured person that at the termination of employment is not eligible for a pension (those having less than ten years of contribution) is not eligible for the reimbursement of the contributions with the interest. He or she receives nothing.
	Disability benefits
	Monthly pension: DB Scheme Same as retirement benefit for total disability. For partial disability, the pension is multiplied by the percentage of loss of capacity for work. The minimum pension is the same as the retirement pension. NDC Scheme Total disability: 60 per cent x monthly average wages in the last three years; Partial disability: 60 per cent x monthly average wages in the last three years x per cent loss of capacity for work; minimum pension: Same as retirement
	Survivors' benefits
Survivor's pension	The survivor's pension is paid if the insured contributed • 20 years of contribution or three years in the last five years before the death. • The death should be due to a non-occupational disease or accident Monthly pension: DB Scheme Same as retirement benefit for the highest amount. The pension is function of the number of dependents: • 100 per cent for three dependents and more; • 75 per cent for two dependents; • 50 per cent for one dependent. NDC Scheme 40 per cent x monthly average wages in the last three years for one dependent; 50 per cent x monthly average wages in the last three years for two dependents; 60 per cent x monthly average wages in the last three years for three dependents and more; • Minimum pension: Same as retirement There are specific conditions for eligibility of the dependents. These are: • Children ○ under 16 years old; or ○ under 19 years old and student. • Grandchildren, brothers and sister disabled or without caregivers ○ under 16 years old; • Spouse • Parents over retirement age or disabled parents • Any of parents or spouse not working and caring for children under eight years old or grandchildren and younger brothers and sisters • Family dependents of the deceased who was on receipt of retirement or invalidity pension and who totally lost capacity for work in months preceding the death; • Step-parents; step-children not receiving alimony from their own parents; • Family dependents of the disappeared.

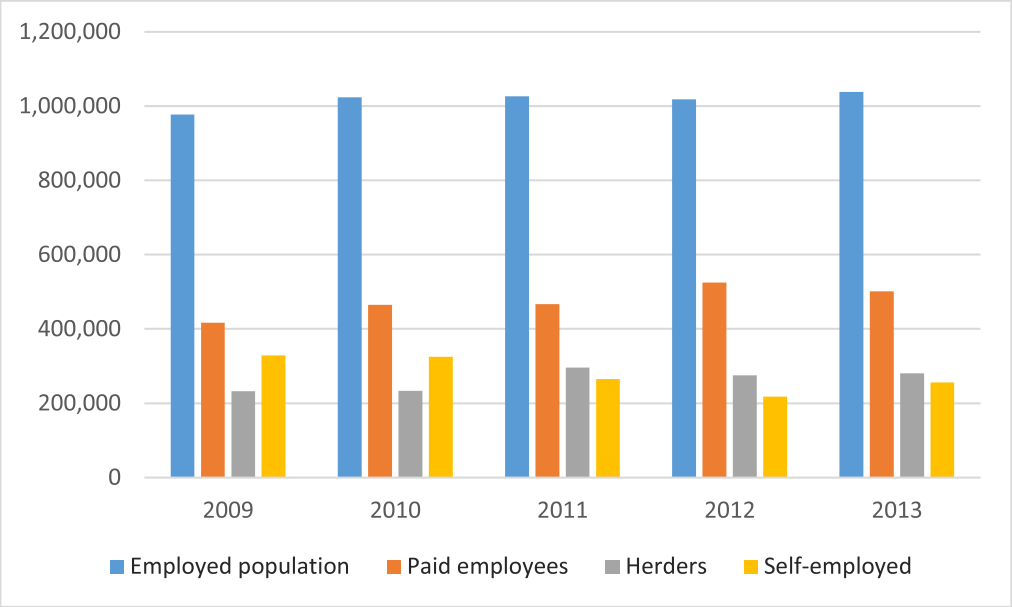
APPENDIX 2. Some information about the herders and self-employed and the informal sector workers

The main assignment related to this report is to analyse the feasibility of a new pension scheme for the herders and low income earners or to adapt the current one with some modifications that better fit their needs. Before formulating some recommendations, it is important to understand well the situation. This section draws up a picture of categories of workers and compared it to herders when possible. The information used in this section comes from SIGO and NSO.

For the purpose of this report, self-employed and workers in the informal sector are identified under the same heading: self-employed.

The following graph shows that, according to data transmitted by NSO, the number of workers (employed population) has increased over the last four years. In fact, 61, 000 workers have been added between 2009 and 2013, an increase of 6.3 per cent. Paid employees and herders have followed this upward trend while the number of self-employed has decreased. In fact, in 2009, there were 328,772 self-employees while in 2013 the number is 255, 981, a decrease of 22 per cent. Over the same period, the number of paid employees has increased by 20 per cent. The trends in the evolution of the number of herders is however contradictory to the one shown in the figure A2.1. In fact, according to official data on herders, their number is declining (see table A2.1). The decline has been more important in younger age. Difference can exist because one of the information is related to the working population and the other to the general population. Difference in the trend is however more difficult to explain.

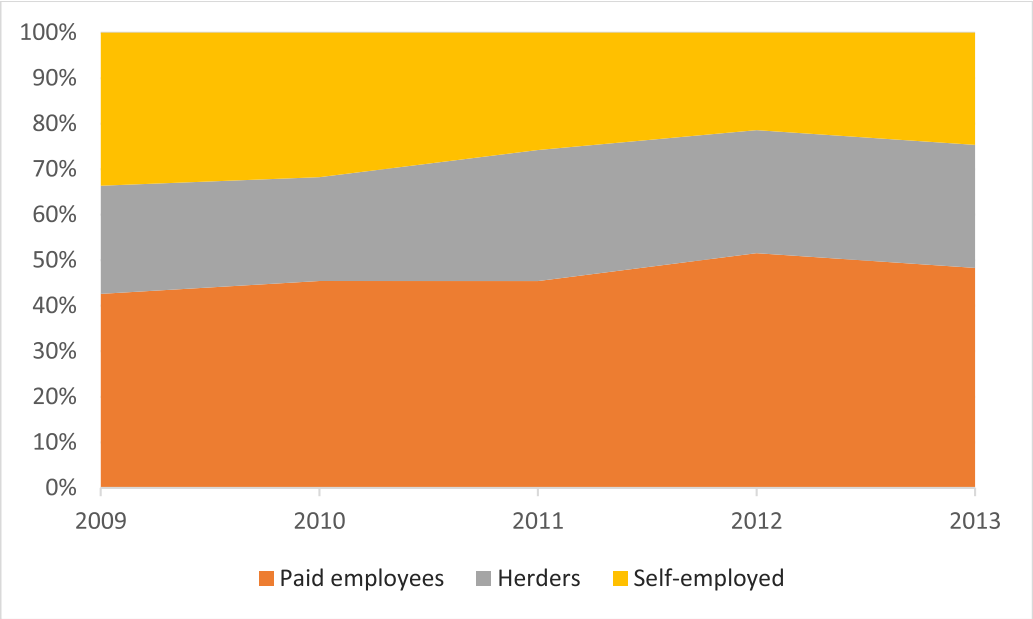
Figure A2.1 Number of workers divided by: Paid employees, herders and self-employed, 2009-2013



Source: NSO

The following graph shows the evolution of the proportion of each category in the employed population. Paid employees were representing a portion of 43 per cent of the employed population in 2009. In 2013, this proportion is 48 per cent. For the herders, these proportion are respectively 24 percent and 27 per cent while for self-employed it is 33 per cent and 25 per cent.

Figure A2.2 Evolution of the proportion of Paid employees, Herders and Self-employed in the employed population, 2009-2013



Source: NSO

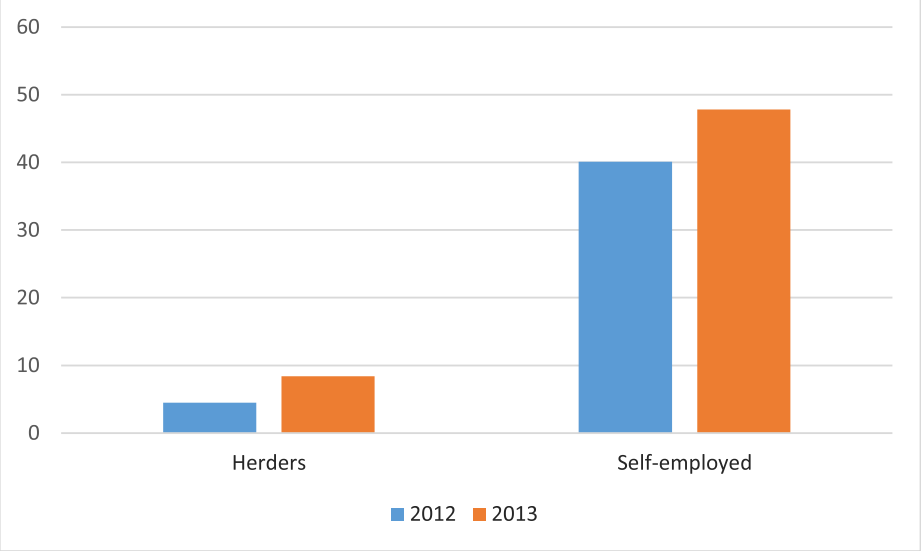
Table A2.1 Evolution of the population of herders

	2009	2010	2011	2012	2013
Household with livestock ('000)	226.6	216.6	211.7	207.8	209.9
Herder households ('000)	170.1	160.3	154.9	146.1	145.3
Herders ('000)	349.3	327.2	311.2	289.7	285.7
Total female herders	161.8	146.5	140.8	136.1	134.7
Age structure % of the herders	100	100	100	100	100
Age group of 15-34	45.1	43.5	41.5	40.7	38.5
Female 35-55, male 35-60	41.1	43.5	46	49.7	51.8
Pension age	13.8	13	12.5	9.6	9.7

Source: NSO

While the coverage rate of paid workers in the private and public sector is close to 100 percent, the one for the herders is considerably lower as presented in the following figure. In fact in 2013, 9 per cent of the herders were contributing to the social security system. The coverage rate is defined as the number of contributors divided by the employed population of the related category of workers, as provided by the NSO.

Figure A2.3 Coverage rate of the herders, the self-employed, 2012-2013



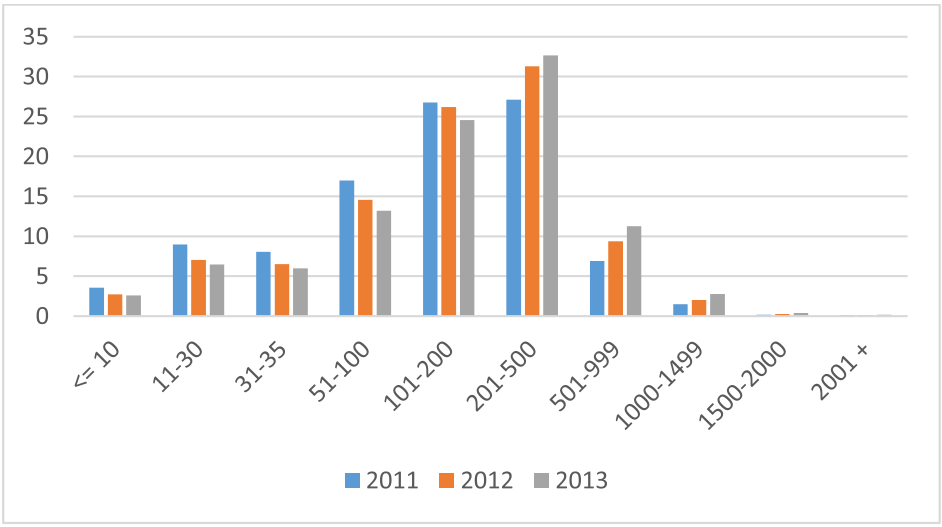
Source: SIGO and NSO

According to a survey of 147 herders the four main reasons explaining the low level of coverage are the following. The proportion having answering the reason appears in bracket:

- The income is seasonal, no regular income (25 per cent)
- The contribution rate is too high (16 per cent)
- They do not know where and whom to approach (11 per cent)
- They hope that I will have enough livestock to maintain my living in future (5 per cent)

All the herders do not have the same level of living. Income of the household is mainly dependent on the size of the livestock. The following figure and table present information about size of annual income and the proportion of the household having this annual income.

Figure A2.4 Distribution of the number of livestock by herder's household, 2011-2013, percent



In 2013, 53 per cent of the household had livestock having less than 200 heads. For these households, according to the data gathered, the average household income is MNT 3, 110 000. With over than 25 per cent going on average to expenditure and investment animal husbandry, it is understandable that they have some difficulties to contribute the social security system. The unavailability of income is accentuated by the fact that herders have access to cash only twice a year during the spring for the cashmere and at the end of the year for meat.

Table A2.2 Annual income from animal husbandry (MNT thousand) by size of the livestock

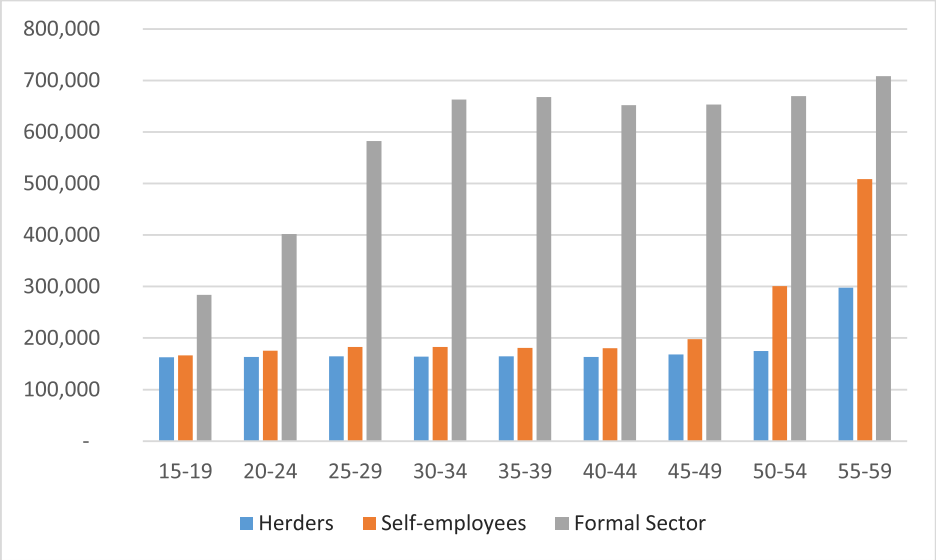
Number of livestock	Income
<= 10	1 160
11-30	2 596
31-35	2 476
51-100	2 898
101-200	3 726
201-500	6 865
501-999	9 938
1000 +	13 171

Source: NSO

The following figures compare some statistics between herders, self-employees and formal sector who contributes at SIGO.

Figure A2.5 shows that the average salary on which contribution is levied for people in the formal sector is considerably higher than the one for herders and Self-employees. In fact, the average salary in the formal sector is about 3.6 times higher. One can notice that the average salary for the self-employees has an upward trend after age 50. This can be explained by the definition of the reference salary for the calculation of pension which is based on the best five years. Declaring high salary close to retirement has the impact of increasing the value of the pension.

Figure A2.5 Average monthly salary, by category of contributors at SIGO, 2013



Source: SIGO

The next figure compares the average number of months that have been contributed in 2013 by each category of workers. While it goes to over ten months for those who are in the private sector, it stays under seven for herders. The important increase in the number of herders between 2012 and 2013 explains the difference. For herders who were contributors in 2010, 2011, 2012 and 2013, the number of months contributed is closer to the one in the formal sector as seen on graph A2.7. But the problem is that only 2,573 herders have contributed in all years over the last four years, which is 11 per cent of all the contributors in 2013. Since the participation to the scheme for herders and self-employees is voluntary, maintaining a high frequency of participation to the scheme will always be a challenge.

Figure A2.6 Average number of months contributed, by category of contributors at SIGO, 2013

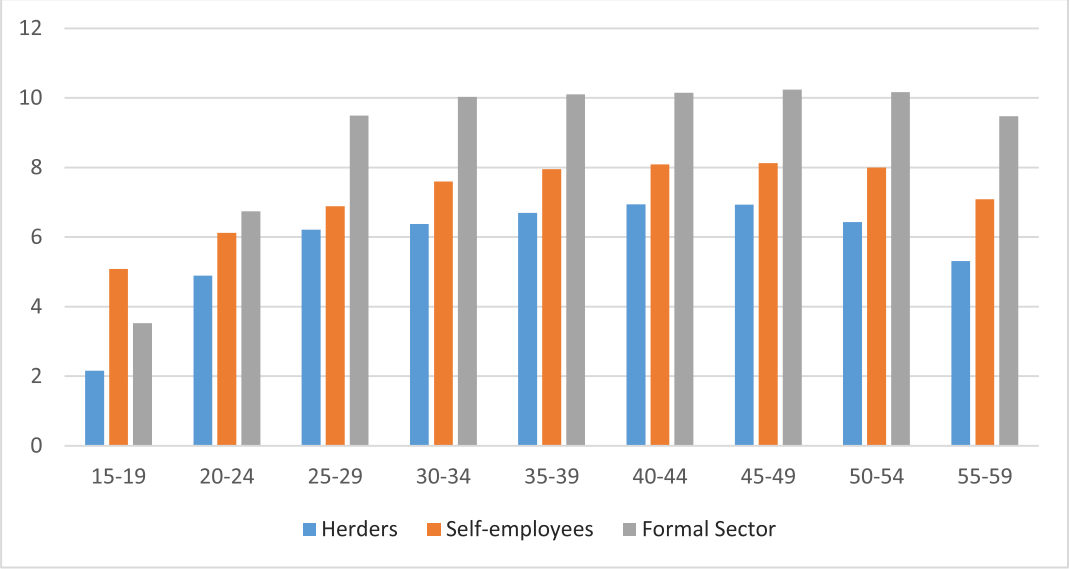
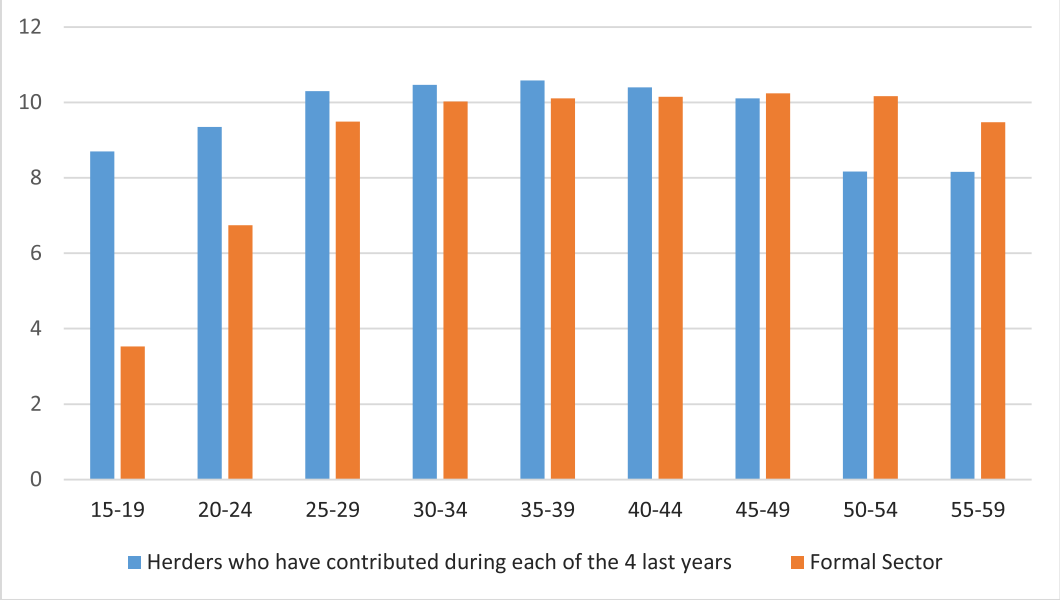


Figure A2.7 Average number of months contributed, by category of contributors at SIGO, 2013



APPENDIX 3. Projections of the general population and of the economy

Future SIGO income and expenditures will be closely linked to changes in the size and age structure of the population, employment levels, economic and wage growth, inflation, and rates of return on investments. To improve the projections of the future SIGO finances, projections of Mongolia's total population and economic activity are required. It is also important to understand that depending on the funding strategy that is adopted to finance a pension plan, the population projection could have an important impact on the contribution rate of the scheme in the future. The impact is higher for a Pay-as-you-plan.

Population projection is the basis on which to estimate the size and composition of the labour force, while projections of GDP and worker productivity growth indicate how many workers are needed in the economy and what their likely income will be. Since these factors are interrelated, population and economic projections are performed together to ensure that consistent assumptions have been used. For this study, hundred year projections of the population, the economy and the SIGO finances have been performed.

Further details on the methods used and the assumptions may be found in following Appendices.

3.1 Population of Mongolia

Population projections require specific assumptions concerning mortality, fertility and migration.

The projection period starts in the year 2013 and extends over 75 years into the future. Table A3.1 shows the breakdown of the population of residents in Mongolia for the year 2013. The data used for the year 2013 came from the National Statistical Office.

Table A3.1 Population of Mongolia, by age and sex, 2013

Age	Male	Female	Total
0- 4	159 891	154 809	314 700
5- 9	124 271	121 232	245 503
10-14	116 371	114 229	230 600
15-19	121 557	122 706	244 263
20-24	137 030	140 953	277 983
25-29	135 432	142 032	277 464
30-34	116 025	122 281	238 306
35-39	107 013	113 036	220 049
40-44	92 887	100 335	193 222
45-49	81 320	90 530	171 850
50-54	67 148	75 939	143 087
55-59	44 102	52 059	96 161
60-64	26 051	32 521	58 572
65-69	17 517	22 694	40 211
70-74	14 964	18 946	33 910
75-79	8 656	12 559	21 215
80-84	3 848	7 095	10 943
85-89	1 221	2 552	3 773
90-94	281	677	958
95-	38	123	161
Total	1 375 624	1 447 308	2 822 932

Source: NSO

3.1.1. Fertility

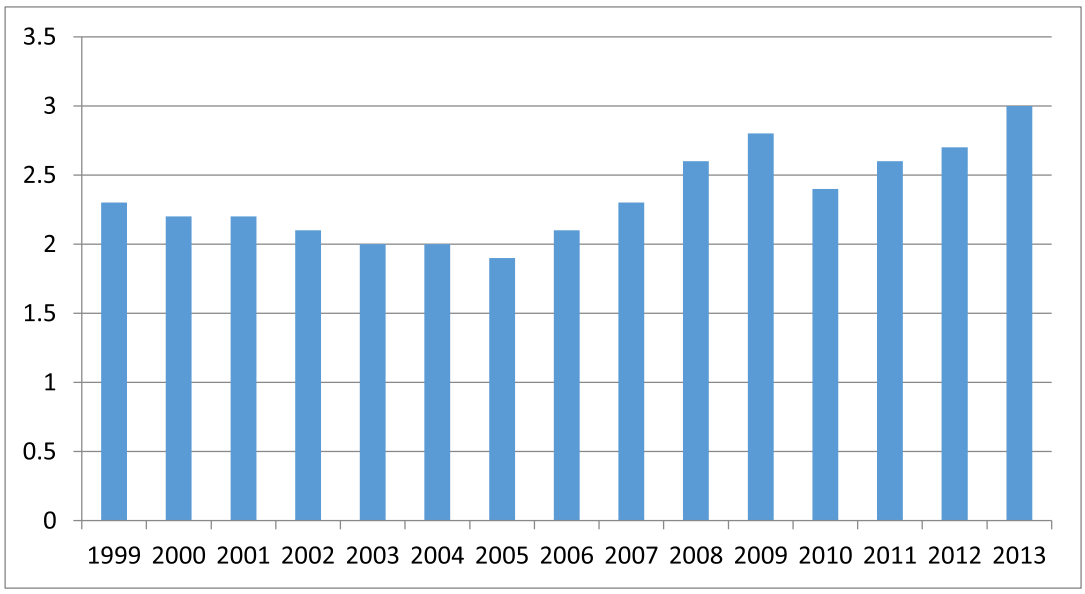
Over the last years of the past two decades the total fertility has increased considerably in Mongolia. From less than two in 2005, it has increased to about three in 2013. This increase can be explained, at least in part, by the implementation of the Child Money Program in 2005.

For this study, the total fertility rate is assumed to be 2.7 in 2014 and decrease gradually to 2.1 children per woman by year 2038 and to remain constant at this level thereafter.

The ratio of male births to female births is assumed to remain constant at 1.03 in the future.

Table A3.2 shows ultimate age-specific and total fertility rates used in this study for the year 2014 and 2038.

Figure A3.1 Total fertility rate, Mongolia, 1999-2013



Source: NSO

Table A3.2 Age-specific and total fertility rates (TFR), 2014 and 2038

Age group	2014	2038
15-19	0.02399	0.01189
20-24	0.14769	0.08148
25-29	0.16157	0.15200
30-34	0.11443	0.12365
35-39	0.07090	0.04540
40-44	0.01885	0.00550
45-49	0.00257	0.00008
TFR	**2.70**	**2.10**

3.1.2 Mortality

The initial mortality rates (2013) of the Mongolia general population used for the population projections as well as the mortality improvements were derived from the 2012 revision of World Population Prospects.[12] The life expectancy displays on the website of the NSO is much higher than the one appearing in the World Population Prospects. For this actuarial study, we use the mortality rates derived from the World Population Prospects to approximate the life expectancy calculated by the NSO.

[12] United Nations: *World Population Prospects*, 2012 revision, Population Division of the Department of Economic and Social Affairs (New York, 2012). Available at: http://esa.un.org/wpp/.

Life expectancies at birth of the general population were estimated at 64.9 years for males and 74.4 years for females in 2013.

Age-specific mortality rates assumed for the years 2011, 2036 and 2061 are given in Table A3.4.

Table A3.3 Life expectancy at selected ages, Mongolia's general population, 2013, 2038, 2063 and 2088

Year	Men			Women		
	At 0	At 20	At 60	At 0	At 20	At 60
2013	64.9	47.4	14.8	74.4	56.5	19.5
2038	69.7	51.0	16.3	78.6	59.6	21.9
2063	74.8	55.5	19.1	81.8	62.4	24.2
2088	79.3	59.8	22.1	83.7	64.2	25.6

Table A3.4 Mortality rates at selected age intervals, 2013, 2038 and 2063 (per 1,000 persons)

Selected ages	Males			Females		
	2013	2038	2063	2013	2038	2063
0	27.7	12.0	6.4	22.3	9.9	5.3
5	0.9	0.4	0.2	0.4	0.2	0.2
10	0.2	0.1	0.1	0.0	0.0	0.0
15	0.7	0.3	0.2	0.3	0.2	0.1
20	1.1	0.6	0.4	0.3	0.2	0.2
25	1.8	1.0	0.6	0.5	0.3	0.3
30	2.6	1.5	0.9	0.6	0.5	0.3
35	3.7	2.1	1.3	0.9	0.7	0.5
40	5.6	3.4	2.0	1.6	1.1	0.8
45	8.9	5.6	3.3	2.8	1.9	1.3
50	14.1	9.4	5.5	4.7	3.2	2.2
55	17.8	13.0	8.0	6.9	4.7	3.2
60	24.4	19.0	12.0	10.5	7.1	4.9
65	34.7	28.2	18.3	16.2	11.2	7.7
70	53.4	44.5	29.8	27.7	19.4	13.6
75	93.2	78.2	53.8	50.7	36.5	26.4
80	139.6	116.8	84.3	85.1	61.8	44.4
85	214.4	185.3	143.5	146.6	113.2	86.7
90	333.5	300.8	250.7	253.8	211.3	174.9
95	522.0	498.2	454.2	466.5	427.4	383.0

3.1.3 Migration

According to the last census, Mongolia has experienced a negative net international migration. The following table displays the immigrants and emigrants in 2010. Both the number of emigrants and the number of immigrants have increased. The mining and quarrying sectors' development can explain the trend.

Table A3.5 Data on international migration, Mongolia, 2000-2010

	Number of Mongolian immigrants and foreign citizens residing Mongolia for a longer period	Number of Mongolian emigrants	Net international migrants
2010	19 011	16 793	2 218
2009	5 460	17 984	(12 524)
2008	4 460	17 553	(13 093)
2007	3 363	13 161	(9 798)
2006	2 800	11 460	(8 660)
2005	3 209	7 941	(4 732)
2004	1 449	4 763	(3 314)
2003	1 043	4 031	(2 988)
2002	805	2 632	(1 827)
2001	628	3 831	(3 203)
2000	1 176	2 094	(918)
Total	43 404	102 243	(58 839)

Source: NSO: Population and Housing Census of Mongolia: Renewed 2010-2040 population projection. 2010

Net migration represents the difference between the number of persons who permanently enter and leave Mongolia and is one of the most difficult assumptions to make in this kind of projection. The internal environment as well as external ones affects considerably the number of immigrants and emigrants. The assumption is that net migration is part of those aspects that could materially affect the results of an actuarial valuation.

For this actuarial study, the net migration (immigrants less emigrants) assumption is assumed to be nil. This is different from the one used in the projection of the 2012 revision of World Population Prospects, which assumed a negative net migration rate. We make the assumption that the negative past trends are cancelled by the continuing development of the mining and quarrying sectors.

3.1.4 Population projection of Mongolia

The total population of Mongolia was 2,822,932 persons in 2013. It is projected to increase to 3,890,176 persons in 2040 and to 4,934,697 persons in 2088. The implied average annual growth rate of the population is therefore of 0.6 per cent for the period 2013 to 2088. Table A3.6 shows the rates of growth for different periods.

Table A3.6 Projected rates of population growth, Indonesia, 2013−2088 (percentage per annum)

Period	Rate of growth
2013-2018	1.82
2019-2023	1.50
2024-2028	1.14
2029-2038	0.84
2039-2048	0.83
2049-2058	0.58
2059-2068	0.38
2069-2078	0.42
2079-2088	0.35

The ratio of the population of Mongolia aged 60 and over to the total population increases from 6.0 per cent in 2013 to 15.4 per cent in 2040 and 26.0 per cent in 2088. This clearly illustrates the ageing process that the population of Mongolia is expected to experience over coming decades, as shown in figure A3.2.

Highlights of the population projection are:

1. Average annual growth of the population over the projection period is 0.6per cent.
2. The total population will increase throughout the projection period to reach 4,934,697 persons in 2088.

3. The growth in the number of people aged 15 to 59 (the working age population) will increase until 2070 and begin to decrease starting in 2071.
4. In 2013, there are 11.0 persons aged 15to 59 for each person aged 60 and over. Fifty five years later, this ratio drops to 2.9. At the end of the projection period, this ratio is 2.1.
5. The average age of the population is 29 years old in 2013 and will increase to about 41 years in 2088.

Figure A3.2 Projected ageing of the population, Mongolia, 2013−2088

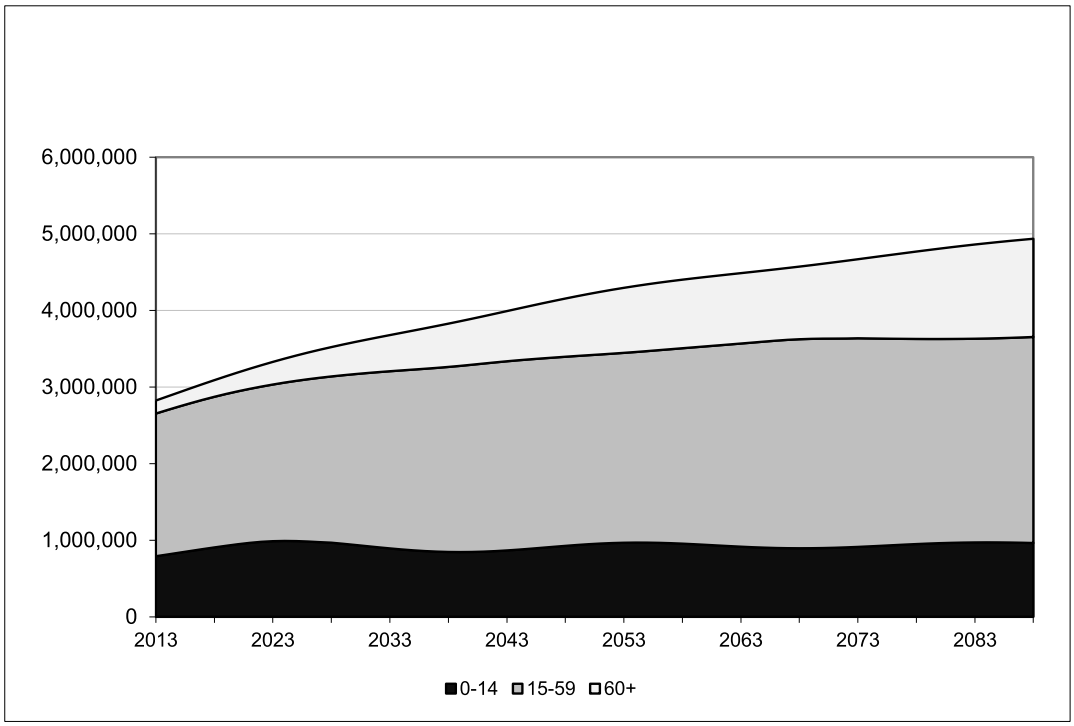
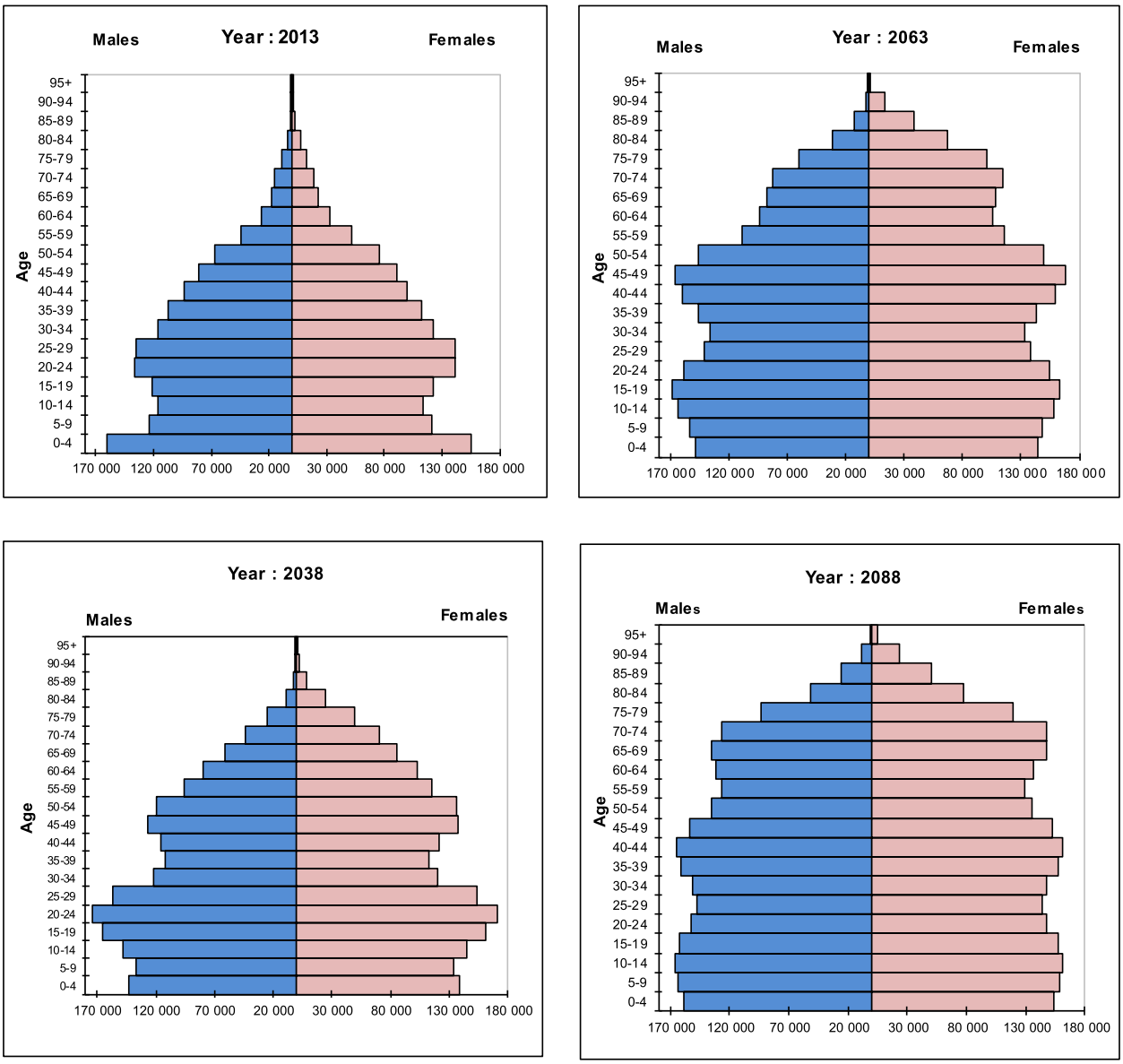


Table A3.7 Mongolian population and dependency ratio, 2013−2088

		Age			
Years	Total	0-14	15-59	60+	Ratio 15-59 / 60+
2013	2 822 932	790 803	1 862 385	169 744	11.0
2018	3 088 869	905 636	1 966 082	217 151	9.1
2023	3 327 278	986 974	2 045 013	295 291	6.9
2028	3 520 483	967 248	2 170 181	383 055	5.7
2038	3 826 456	846 423	2 415 234	564 799	4.3
2048	4 154 391	925 922	2 468 444	760 025	3.2
2058	4 400 251	954 756	2 550 659	894 836	2.9
2068	4 571 022	894 482	2 728 445	948 096	2.9
2078	4 767 525	949 195	2 677 708	1 140 623	2.3
2088	4 934 697	963 160	2 689 433	1 282 104	2.1

Figure A3.3 Population pyramid, Mongolia, 2013-2038-2063-2088

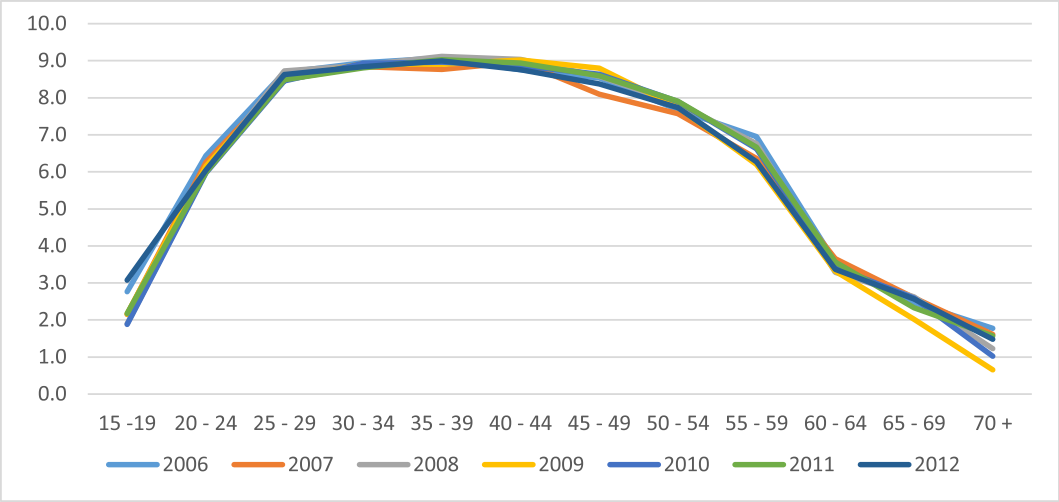


3.2 Macroeconomic framework

3.2.1 Labour force

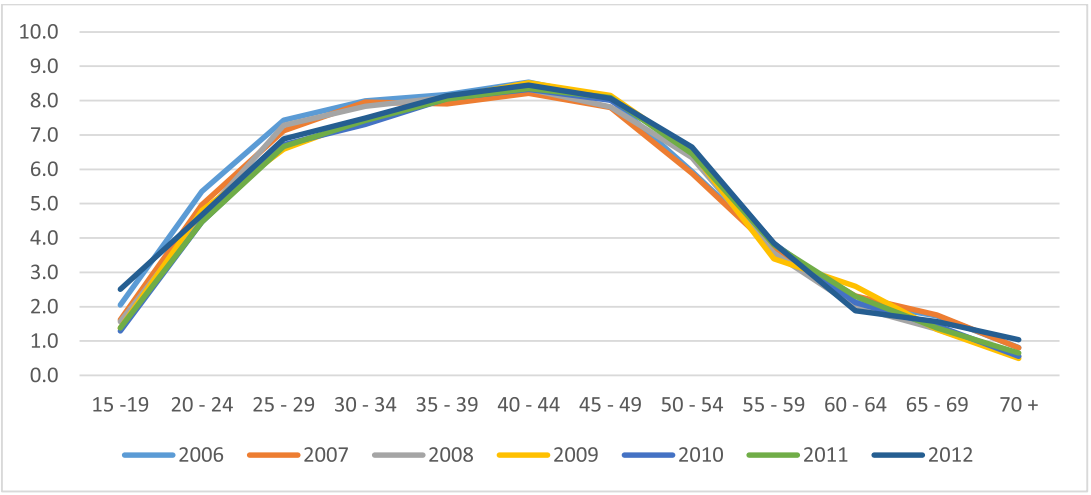
The projection of the labour force is performed by applying labour force participation rates to the corresponding projected population groups of Mongolia. For both, the last seven years show few movements in the labour force participation rates by age groups. For females, it is possible to see a decrease for age below 35 years. This can be partly explained by at least an increase in fertility rates since 2006.

Figure A3.4 Labour force participation rates by age group, male, Mongolia, 2006-2012 (percentage)



Source: NSO

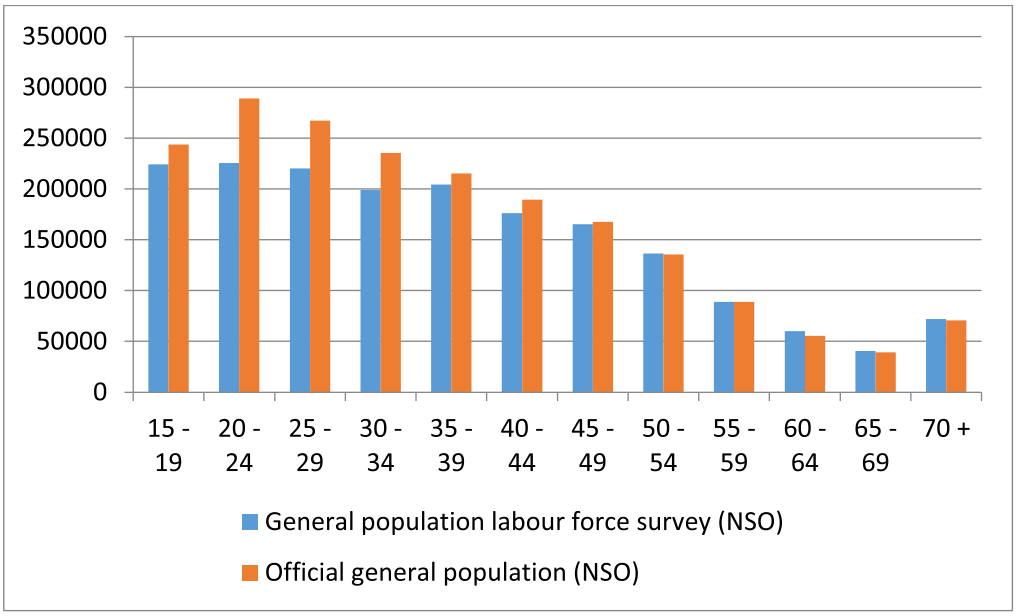
Figure A3.5 Labour force participation rates by age group, female, Mongolia, 2006-2012 (percentage)



Source: NSO

It is important to note that during the analysis phases of the data, we found important differences between the general population by age and sex, used for the labour force survey and the official general population. The flowing graphs are showing the differences for males and females. The differences are more significant at younger ages than at older age. According to the discussions we had with the NSO, the participation rate derived from the survey should be applied to the general population. There are no problems to proceed this way. It is however important to note that doing this will off course affect the total labour force participation rate and unemployment rate. In fact, the proportion that represents people at younger ages will be higher, decreasing the total labour force participation rate a little bit and increasing the total unemployment rate.

Figure A3.6 Comparison of the general population used in the labour force survey and the official general population, by group of age, Mongolia, 2012

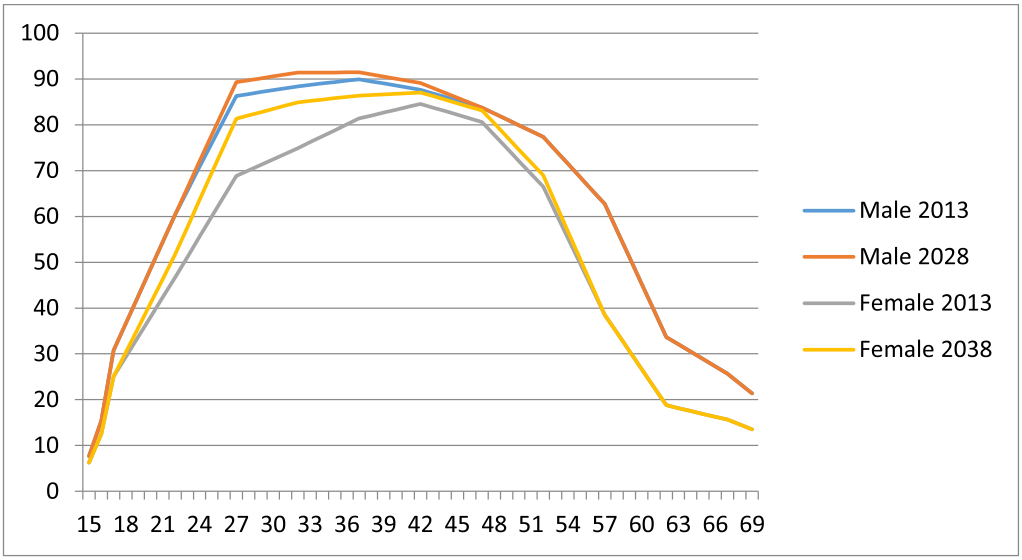


For the projection, the following assumptions have been made:

- For males, labour force participation rates by age are increasing slightly during the first 15 years of the projection and are remaining stable thereafter.
- For females, the growth of the labour force participation rates is higher than the one for the men. The labour force participation rate increase during the first 25 years of the projection, the same period for which the fertility rate is assumed to decrease. Starting in 2038, the labour force participation rates by age are assumed to be constant.

The figure A3.7 presents the labour force participation rates used in the present actuarial valuation.

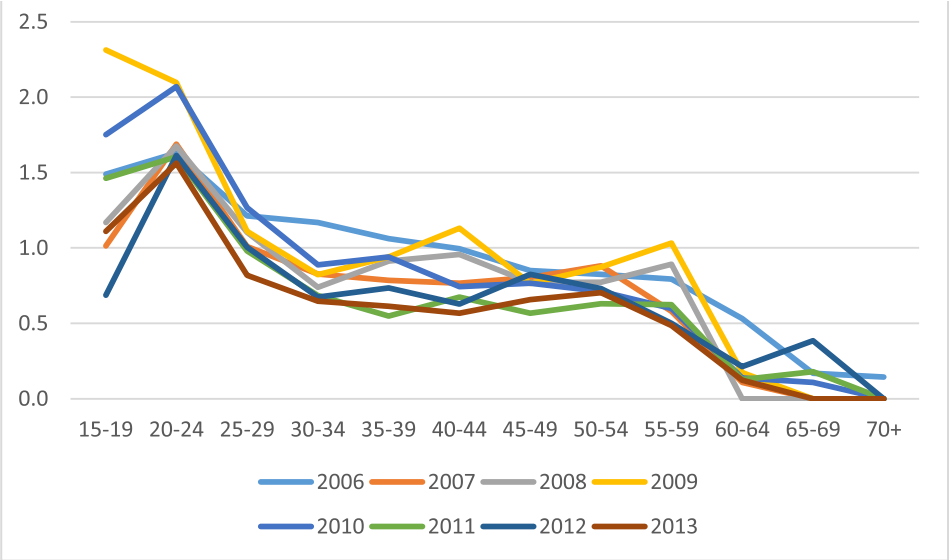
Figure A3.7 Labour force participation rates by group of age and sex used in the actuarial study, Mongolia, 2013, 2028, 2038 (as a percentage of population)



3.2.2 Unemployment

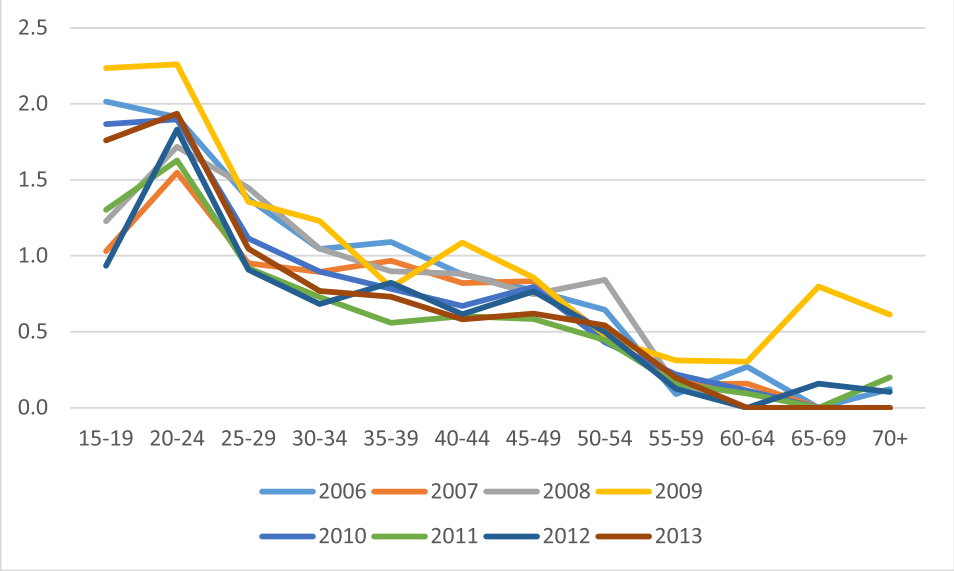
Unemployment rates by age and sex vary considerably. Younger people have an unemployment rate that is higher than older people. As shown in the next three graphs, unemployment is also more variable from year to year compared to labour force participation rate. Globally, the official unemployment rate in 2013 was 7.9 per cent. Over last 26 quarters, unemployment rate has varied between 6.3 and 12.8.

Figure A3.8 Unemployment rates by age group, male, Mongolia, 2006-2013, (as a percentage of labour force)



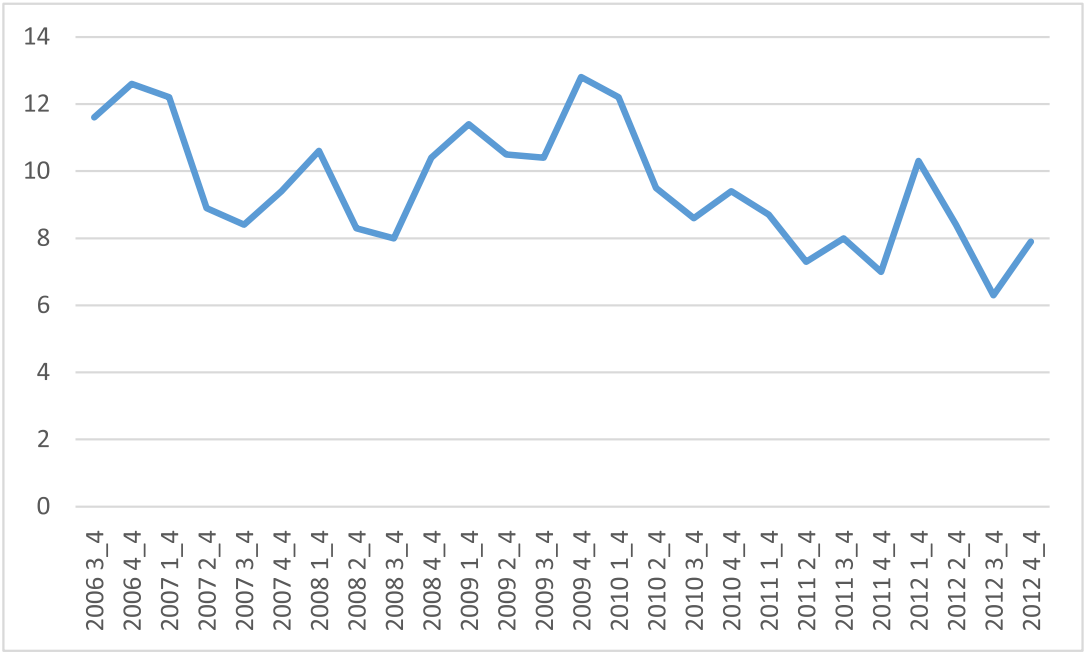
Source: NSO

Figure A3.9 Unemployment rates by age group, female, Mongolia, 2006-2013, (as a percentage of labour force)



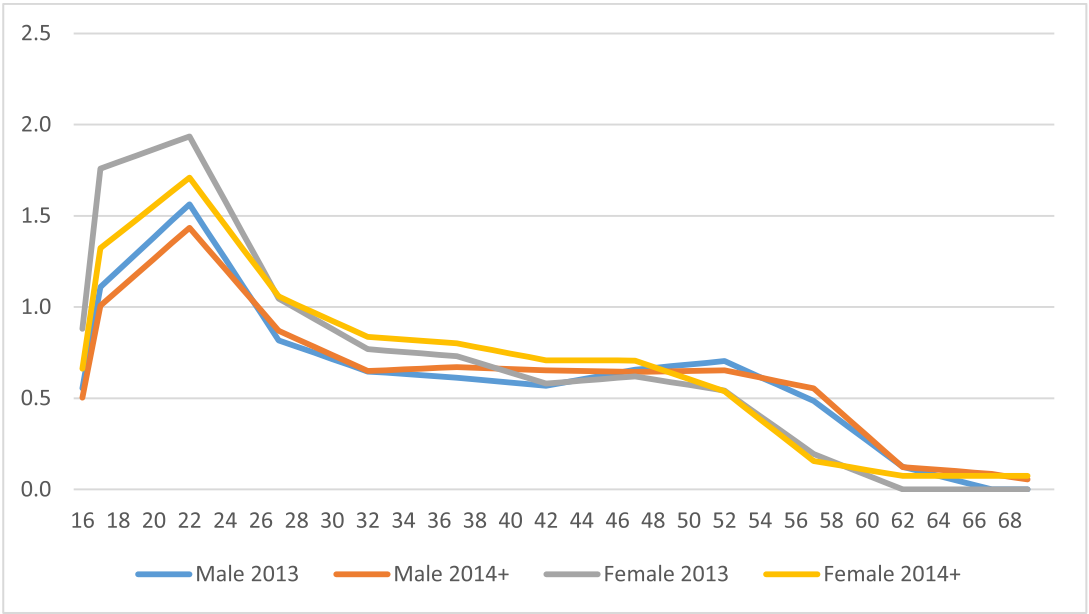
Source: NSO

Figure A3.10 Global unemployment rates by quarter, 2006-2013 (as a percentage of labour force)



For the actuarial study, starting 2014, we maintain the unemployment rate by age constant throughout all the projection period.

Figure A3.11 Unemployment rates by age group and sex, Mongolia, 2013-2088 (as a percentage of labour force)



For the projection from 2013 to 2088, total unemployment rate is assumed to decrease gradually from 8.3 per cent to reach 7.5 per cent in 2088. The decrease in the global unemployment rate is due to the ageing process of the labour force. The proportion of older workers, those already having lower unemployment rate, is increasing, causing the global unemployment rate to decrease.

Employment is calculated as the residual obtained by subtracting the assumed number of unemployed persons from the projected labour force, by age group and by sex.

3.2.3 Herders

As said previously, for the purpose of this report, self-employed and workers in the informal sector are identified under the same heading: self-employed. One of the assignments in this report is the analysis of a specific pension scheme for the herders and the low income self-employed. It is important then, to have an idea of the age and sex structure of these two populations. There is currently no definition of low income self-employed and there is no data. The effort has been concentrated on estimating the age distribution of the herders.

There is no equality in the coverage offered by the current legislation. People in the informal sector are not required to contribute to SIGO since coverage is voluntary. Also, compliance is usually more difficult in the informal sector. Because of that, it is important to separate the projection into two categories of workers: those who are in the formal sector and those who are in the informal one.

According to the data transmitted, it is possible to approximate each category of workers by age and sex. To do this, we have used the following information:

- The distribution of the employed population;
- The distribution of the herders' household by individual age of the members;
- The distribution of the herders by broad category of age (15 to 34 years old, 35 to 59 years old and number of herders in pensionable age);
- The distribution of the insured population at SIGO (Total and herders and self-employed).

With this data, it was possible to estimate the population of herders by sex and age.

Table A3.8 Estimated breakdown of the employed population and the herders, male, by group of age, 2013

	Employed population Male	Herders Male
15-19	29 250	10 809
20-24	70 718	11 346
25-29	102 911	18 289
30-34	95 640	24 134
35-39	89 880	24 420
40-44	76 495	20 035
45-49	63 475	16 062
50-54	47 963	13 684
55-59	25 944	9 666
60-64	9 471	3 563
65-69	4 465	2 249
Total	616 213	154 256

Figure A3.12 Estimated breakdown of the employed population and the herders, male, by group of age, 2013

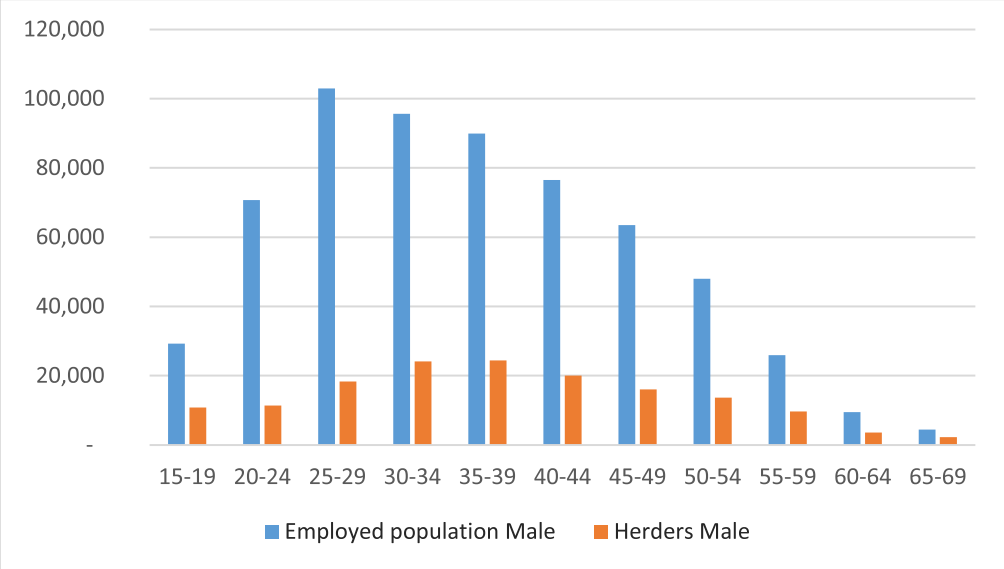
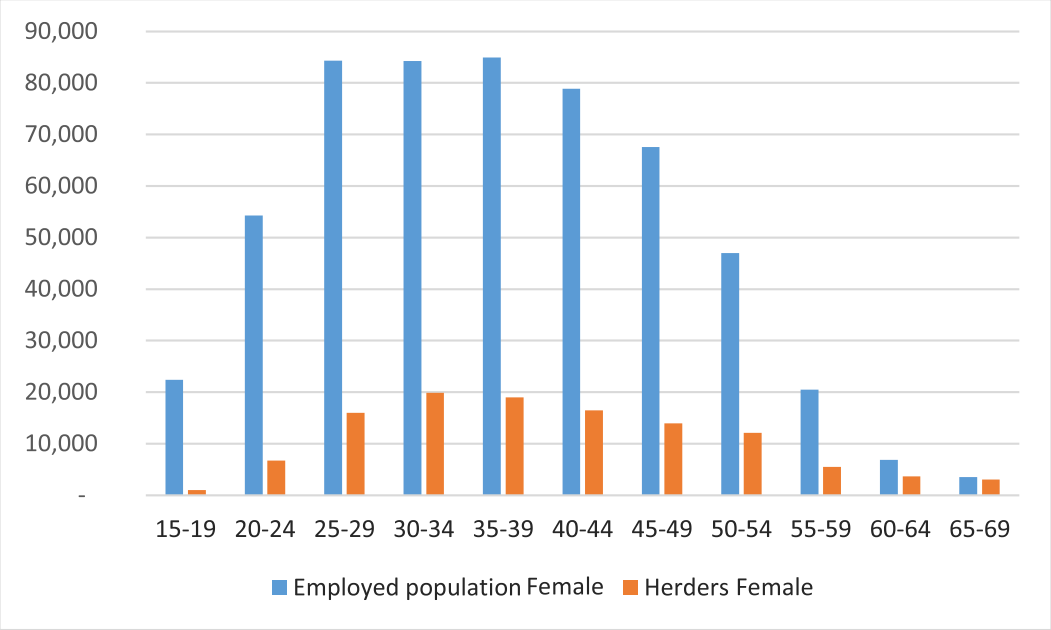


Table A3.9 Estimated breakdown of the employed population and the Herders, Female, by group of age, 2013

	Employed population Female	Herders Female
15-19	22 362	1 003
20-24	54 261	6 729
25-29	84 324	15 978
30-34	84 238	19 877
35-39	84 927	18 955
40-44	78 892	16 477
45-49	67 579	13 916
50-54	46 980	12 087
55-59	20 514	5 523
60-64	6 880	3 644
65-69	3 511	3 078
Total	554 468	117 267

Figure A3.13 Estimated breakdown of the employed population and the Herders, Female, by group of age, 2013



3.2.4 Labour market balance

The resulting labour market balance of Mongolia is presented in table A3.10.

Table A3.10 Labour market balance, Mongolia, 2013–2088

	2013	2038	2063	2088
Population (no. of persons)				
Males	1 375 624	1 836 592	2 158 677	2 416 571
Females	1 447 308	1 989 864	2 326 917	2 518 126
Total	2 822 932	3 826 456	4 485 594	4 934 697
Population aged 15–69 (no. of persons)				
Males	946 082	1 327 529	1 507 887	1 622 235
Females	1 015 086	1 416 658	1 538 545	1 618 700
Total	1 961 168	2 744 187	3 046 432	3 240 934
Labour force participation rate (%)				
Males	71	68	68	67
Females	60	59	60	58
Total	65	63	64	63
Labour force (no. of persons)				
Males	668 200	900 343	1 031 325	1 084 279
Females	607 615	833 413	921 259	943 279
Total	1 275 814	1 733 756	1 952 584	2 027 559
Unemployment rate (%)	8.2	7.9	7.6	7.5
Employed persons (no. of persons)				
Males	616 213	832 418	956 549	1 007 695
Females	554 468	763 809	846 775	868 018
Total	1 170 681	1 596 227	1 803 324	1 875 713
Herders 15-69 (no. of persons)				
Males	154 256	130 563	130 563	130 563
Females	117 267	99 255	99 255	99 255
Total	271 523	229 818	229 818	229 818
Proportion of herders sector (%)	23.2	14.4	12.7	12.3

3.2.5 Inflation and salary increases

The annual increase in the remuneration of an insured person consists of three components: the changes in the cost of living, the general economic productivity increase and the increase in personal productivity for work experience and seniority.

The increase in the cost of living can be measured through the Mongolia Consumer Price Index. The cost of living has increased at an annual rate of 10.6 per cent over the last eight years (see table A3.11). For the first eight months of 2014, the inflation rate was over 13 per cent.

According to the monetary statement, the core objective of the Bank of Mongolia is to maintain price stability. One of the bank's objectives is a target inflation rate of lower that 8 per cent. Because of the monetary policy, it is assumed that the rise in cost of living will decrease in line with the official government projection for the first four years except for the first year of projection where it is assumed to be 13.25 per cent. Starting from 2018, the inflation rate is assumed to slowly decrease to an ultimate long term level of 4.5 per cent per year. This level is considered representative of the long term expected level in a stable economic environment.

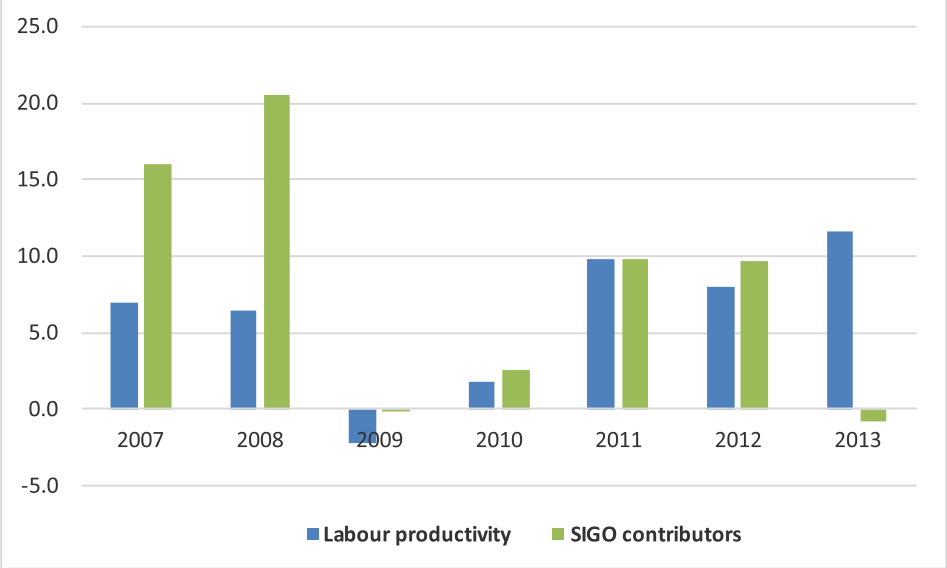
Table A3.11 Inflation (Consumer Price Index), Mongolia, 2006−2013

Year	Inflation
2006	4.3
2007	9.6
2008	28.0
2009	8.0
2010	10.1
2011	9.2
2012	14.3
2013	10.5
Average	10.6

Source: NSO

SIGO has data on insured persons that can be used to analyse the evolution of basic salaries over time. From the data analysis on salaries insured from 2006 to 2013, it appears that over that period of eight years, the average salary has increased at an annual rate of 21.6 per cent. During the same period, inflation was 12.6 per cent annually, showing that the average annual real increase of earnings was 8 per cent.

Figure A3.14 Real salary increases, real Labour productivity increases, 2007−2013



Salary adjustments depend to some extent on the evolution of the productivity of the employees, namely the labour productivity (GDP divided by the number of employed workers). For the period 2006 to 2013, the real labour productivity has been 6 per cent. For this actuarial study, it is assumed that both labour productivity and salary increases will move in the same direction and in the same percentage. The assumption is an increase of 4.5 per cent for the first 15 years. The level of real salary increase is gradually lowered to reach an ultimate assumption of 1.5per cent in 2042 and over.

The increase in personal productivity for work experience and seniority is reflected in the salary scale distribution (Appendix 4.).

Appendix 2 also explains the assumptions used for the investment return on assets. An ultimate annual nominal interest rate of return of 7.5 per cent is used in this actuarial study.

APPENDIX 4. Methodology

4.1 Methodology, data and assumptions related to the social security scheme

The projections done for this report make use of the comprehensive methodology developed at the International Financial and Actuarial Service of the ILO for reviewing the long-term actuarial and financial status of a national pension scheme. The projections have been undertaken by modifying the generic version of the ILO modelling tools to fit the specific case of the Mongolian social security system. These modelling tools include a population model, an economic model, a labour force model, a wage model, a long-term benefits model and a short-term benefits model.

As shown in the preceding appendix, the process begins with a projection of Mongolia's future demographic and economic environment. Next, projection factors specifically related to social security are determined and used in combination with the demographic and economic framework to estimate future cash flows and the scheme reserve. The projection's assumptions and their selection takes into account both recent experience and future expectations, with emphasis placed on long-term trends rather than giving undue weight to recent experience.

For the projection, it is important to address all SIGO revenue and expenditure items. Long term benefits (pensions) projections are performed following a year-by-year cohort methodology. For each year up to 2088, the number of contributors and pensioners, and the tugrug value of contributions, benefits and administrative expenditure, are estimated. The contribution income, contribution rate, contribution density as well as the collection rate are determined from the projected total insurable earnings once the projections of the insured (covered) population, as described in the next section, are complete,. Benefit amounts are obtained through contingency factors based primarily on plan experience and applied to the population entitled to benefits. Investment income is based on the assumed yield on the beginning-of-year reserve and net cash flow in the year. The SIGO's administrative expenses are modelled as a flat percentage of insurable earnings. Finally, the year-end reserve is the beginning-of-year reserve plus the net result of cash inflow and outflow.

The assumption is that administrative expenses are 0.5 per cent of total insurable earnings each year.

4.2 SIGO population data and assumptions

The projection of the insured population requires a certain amount of information and a number of assumptions to be made. Projections start with the number of contributors as at the date of the analysis. The growth of this population is then estimated using the assumptions described in the next section. Several other assumptions of decrement are required, namely retirement rates by age and sex, prevalence rate of disability and mortality rates. Finally, a distribution assumption is required for new entrants into the covered population. All the data necessary to perform an actuarial valuation were not available. Some information coming from the previous actuarial valuation report has been used to perform this study.

4.2.1 Insured population as of the valuation date

Data on the insured population was obtained from SIGO. The information transmitted was validated to ensure that all the data are comprehensive and consistent with that used in the previous actuarial valuation. Tables A4.1 to A4.3 show the number of members who contributed during the last financial year preceding the projection date (2013), by age and sex. Data are shown separately for paid employees in the formal sector, the herders, and other workers in the informal sector labelled as self-employed in this study.

Table A4.1 Distribution of active members (contributors) by age and sex for the year 2013, paid employees

Age	Males	Females	Total
15 - 19	4 113	2 053	6 166
20 - 24	47 693	28 153	75 846
25 - 29	68 431	65 337	133 768
30 - 34	49 416	50 872	100 288
35 - 39	38 916	44 601	83 517
40 - 44	34 929	42 336	77 265
45 - 49	30 633	36 574	67 207
50 - 54	27 476	31 884	59 360
55 - 59	16 663	14 573	31 236
60 - 64	6 907	3 277	10 184
65 - 69	2 120	923	3 043
Total	327 297	320 583	647 880

Table A4.2 Distribution of active members (contributors) by age and sex for the year 2013, herders

Age	Males	Females	Total
15 - 19	737	74	811
20 - 24	1 071	557	1 628
25 - 29	905	998	1 903
30 - 34	1 472	1 654	3 126
35 - 39	1 999	2 492	4 491
40 - 44	1 810	2 558	4 368
45 - 49	1 245	2 789	4 034
50 - 54	749	1 851	2 600
55 - 59	452	85	537
60 - 64	30	-	30
65 - 69	-	-	-
Total	10 470	13 058	23 528

Table A4.3 Distribution of active members (contributors) by age and sex for the year 2013, self-employed

Age	Males	Females	Total
15 - 19	987	667	1 654
20 - 24	3 900	6 641	10 541
25 - 29	6 145	13 510	19 655
30 - 34	6 627	13 450	20 077
35 - 39	6 883	13 260	20 143
40 - 44	6 172	11 711	17 883
45 - 49	4 974	10 983	15 957
50 - 54	3 586	9 100	12 686
55 - 59	2 033	1 374	3 407
60 - 64	339	-	339
65 - 69	-	-	-
Total	41 646	80 696	122 342

4.3 Projection of the insured population

The projection of the insured population constitutes the basis for projections of the scheme's costs. Generally, these projections require the use of assumptions pertaining specifically to the population, such as retirement rate by age and sex.

The insured population was projected by applying an initial coverage rate to the employed population. Retirement rates, mortality rates, disability rates and the distribution of new entrants are all estimated by age, sex and group.

Growth of insured population

In order to forecast SIGO's costs, the initial insured population has to be projected over the long term. To do this, an annual growth rate has been used. For all workers other than the herders, the growth of the insured population reflects long term trends in the evolution of the employed population. Information received indicates that the growth rate of the insured population is going to continue to increase in coming years. For the herders, the trends is however downward. Tables A4.4 to A4.8 show a separate summary of the increase in the population for paid and formal sector employees, herders and the self-employed. For the herders and the self-employed, the evolution is shown for a voluntary system as well as a mandatory system.

Table A4.4 Insured population growth assumptions, by sex and 25-year period (percentages), paid employees and formal sector

	2013-2038	2038-2063	2063-2088	2088-2113	Average
	%	%	%	%	%
Males	1.9	0.6	0.1	0.1	0.7
Females	1.3	0.5	0.1	0.1	0.5
Total	1.6	0.5	0.1	0.1	0.6

Table A4.5 Insured population growth assumptions, by sex and 25-year period (percentages), herders, voluntary system

	2013-2038	2038-2063	2063-2088	2088-2113	Average
	%	%	%	%	%
Males	4.0	0.0	0.1	-0.1	1.0
Females	2.8	-0.1	0.1	0.0	0.7
Total	3.4	0.0	0.1	-0.1	0.8

Table A4.6 Insured population growth assumptions, by sex and 25-year period (percentages), herders, mandatory system

	2013-2038	2038-2063	2063-2088	2088-2113	Average
	%	%	%	%	%
Males	9.9	0.0	0.1	-0.1	2.4
Females	7.9	-0.1	0.1	0.0	1.9
Total	8.9	0.0	0.1	-0.1	2.2

Table A4.7 Insured population growth assumptions, by sex and 25-year period (percentages), self-employed, voluntary system

	2013-2038	2038-2063	2063-2088	2088-2113	Average
	%	%	%	%	%
Males	2.6	0.5	0.1	0.1	0.8
Females	1.6	0.4	0.0	0.1	0.5
Total	2.0	0.5	0.1	0.1	0.6

Table A4.8 Insured population growth assumptions, by sex and 25-year period (percentages), self-employed, mandatory system

	2013-2038	2038-2063	2063-2088	2088-2113	Average
	%	%	%	%	%
Males	6.4	0.5	0.1	0.1	1.8
Females	3.2	0.4	0.0	0.1	0.9
Total	4.6	0.5	0.1	0.1	1.3

4.3.1 Distribution of new entrants

The distribution of the covered population is established by using a coverage rate to the employed population. A separate model is used to project the total population of herders, and the covered population is derived by similarly applying a coverage rate to the projected population of herders. Because of the methodology that uses a coverage rate, the distribution of new entrants is not explicit but is derived from the evolution of the employed population (or the population of herders).

4.3.2 Disability incidence rates

Table A4.9 shows the expected incidence rates of insured persons qualifying for invalidity benefit which is assumed for all projection years. The rates are based on the experience of SIGO. On retirement age, the model takes into account that disability pension are transformed into retirement pension.

Table A4.9 Disability rates, by age and sex (per 100 insured)

Age	Males	Females
15	0.000	0.000
20	0.006	0.000
25	0.081	0.023
30	0.241	0.216
35	0.275	0.307
40	0.761	0.558
45	1.929	1.479
50	3.271	2.016
55	5.022	0.000
60	0.000	0.000

People with disabilities generally have a higher mortality rate than active participants. Due to the fact that the data to analyse mortality experience were not available and also the fact that a lot of people are receiving disability benefits and that these disability benefits are sometimes assimilated to a retirement pension, it has been assumed that the mortality rate of the disabled is the same as for the active and insured population.

4.3.3 Retirement rates

There are no herders and self-employed that are assumed to work beyond the retirement age. The retirement ages are based on the evolution of the employed population as well as the coverage rates.

4.4 Salary scale and density of contribution

Tables A4.10 to A4.12 show the salary scale used at the beginning of the projection period. Earnings are projected using the assumptions described earlier.

For the purpose of projection, the actuarial model distributes average wages into three sections (low, medium and high) with the aim of measuring the effect of the minimum pension and the ceiling. It is estimated that the dispersion observed in the distribution of the earnings will remain constant throughout the projection period. The overall average salary increase assumption is based on the salary assumptions discussed in the previous appendix.

Table A4.10 Distribution of annualized earnings[1] by age and sex, 2013 (tugrug), paid and formal sector employees

Age	Males	Females	Both sex
15-19	2 318 710	3 112 994	2 583 171
20-24	4 643 828	5 032 783	4 788 203
25-29	7 784 567	6 117 104	6 970 119
30-34	9 084 673	6 797 945	7 924 709
35-39	8 983 386	7 100 766	7 978 001
40-44	8 676 854	7 080 199	7 801 995
45-49	8 299 122	7 354 947	7 785 302
50-54	8 379 278	7 428 529	7 868 603
55-59	8 510 314	7 715 494	8 139 495
60-64	8 410 967	6 689 982	7 857 190
65-69	7 336 022	5 385 025	6 744 247
Average	7 837 623	6 722 778	7 285 977

Table A4.11 Distribution of annualized earnings[1] by age and sex, 2013 (tugrug), herders

Age	Males	Females	Both sex
15-19	1 948 108	1 961 520	1 949 332
20-24	1 938 568	2 009 950	1 962 991
25-29	1 943 932	2 001 450	1 974 097
30-34	1 963 641	1 972 445	1 968 299
35-39	1 975 736	1 970 745	1 972 967
40-44	1 960 059	1 962 384	1 961 421
45-49	1 978 116	2 035 037	2 017 470
50-54	2 043 872	2 124 964	2 101 604
55-59	3 731 541	2 738 945	3 574 426
60-64	6 098 163		6 098 163
65-69			
Average	2 055 599	2 013 883	2 032 446

Table A4.12 Distribution of annualized earnings[1] by age and sex, 2013 (tugrug), self-employed

Age	Males	Females	Both sex
15-19	1 980 551	2 023 417	1 997 837
20-24	2 073 808	2 125 690	2 106 494
25-29	2 147 339	2 213 505	2 192 819
30-34	2 147 763	2 211 453	2 190 430
35-39	2 123 375	2 196 661	2 171 618
40-44	2 135 725	2 173 823	2 160 674
45-49	2 177 924	2 460 534	2 372 441
50-54	2 541 121	4 035 542	3 613 109
55-59	5 977 285	6 279 115	6 099 009
60-64	7 116 518		7 116 518
65-69			
Average	2 395 859	2 504 154	2 467 289

[1] Annualized earnings are the earnings people would have if they have worked for all the year. The annualized earnings are the average monthly earnings time

The density of contributions represents the proportion of years during which participants pay contributions to the scheme. A high contribution density means that participants will accumulate pension benefits quickly and that the proportion of those entitled to a pension will increase. This will be to the detriment of those entitled only to a grant benefit. In the private sector, it is normal that the density of contribution is less than that observed in the public sector due to less stability in employment.

The contribution density assumed in this actuarial valuation is shown in tables A4.13 to A4.15 and is based on the experience of the scheme. The density of contribution factors are assumed constant throughout the projection period for paid employees while they increase for the other categories of workers as more and more people are covered. After 15 years they are held constant.

Table A4.13 Density of contributions, by age and sex (percentages), paid and formal sector employees

Age	Males	Females
15-19	63.9	56.5
20-24	68.7	79.2
25-29	80.4	88.5
30-34	81.5	90.3
35-39	82.8	91.5
40-44	84.3	92.2
45-49	84.7	93.3
50-54	87.2	93.0
55-59	89.8	81.4
60-64	76.3	72.6
65-69	77.9	75.1

Table A4.14 Density of contributions, by age and sex (percentages), herders

Age	Males	Females
15-19	14.9	48.2
20-24	33.5	54.9
25-29	47.6	55.6
30-34	49.0	56.8
35-39	51.2	59.5
40-44	53.2	61.1
45-49	48.4	61.9
50-54	45.3	56.9
55-59	43.6	47.6
60-64	33.9	
65-69		

Table A4.15 Density of contributions, by age and sex (percentages), self-employed

Age	Males	Females
15-19	31.7	49.9
20-24	48.1	41.7
25-29	53.9	45.4
30-34	59.2	52.4
35-39	62.7	55.0
40-44	64.2	55.6
45-49	62.6	58.2
50-54	63.2	54.1
55-59	65.3	39.3
60-64	43.9	
65-69		

4.5 Past service

Some information on credited service for the active insured populations was transmitted by SIGO. It is however not all the credited services that are registered on the computerized system of SIGO. In fact, only the services since 2000 have been added on the system. To overcome this data availability problem, we have derived the years of service by using the years of service that were used in calculating the pensions of the new pensioners for retirement, invalidity and death in 2011, 2012 and 2013. Table A4.16 shows, for active members, the total number of years of contributions. Numbers are shown by age and sex. No data were available for the inactive population. This justifies our decision not to include the inactive population in the projections. For simplicity, the same average years of service has been used for all the members. The number of years of service has also been used to derive the accumulated reserve for the NDC scheme. In fact, the accumulated reserve has been evaluated as the average number of years of service times the average salary.

Table A4.16 Average past contribution years for active insured people, by age and sex, December 2013, all members

Age	Males	Females
15-19	2.0	2.1
20-24	3.5	3.4
25-29	4.7	4.7
30-34	6.0	6.2
35-39	7.4	7.8
40-44	10.3	10.3
45-49	15.1	14.5
50-54	20.7	19.0
55-59	25.8	23.9
60-64	25.7	27.3
65-69	25.3	19.9

4.6 Pensioners at the valuation date

Tables A4.17–20 show the distribution of pensioners used for this actuarial valuation as at the valuation date.

Table A4.17 Old-age average annual pensions in payment, by age and sex, December 2013 (tugrug)

	Male		Female	
Age	Number	Average amount	Number	Average amount
0-4				
5-9				
10-14				
15-19				
20-24				
25-29				
30-34				
35-39	3	746 667	3	960 000
40-44	6	2 575 000	12	2 217 500
45-49	15	2 159 333	289	2 346 436
50-54	402	2 775 995	13 625	2 211 640
55-59	4 753	2 833 835	45 963	2 372 443
60-64	20 274	2 772 011	31 131	2 644 210
65-69	14 424	3 440 574	21 740	2 655 676
70-74	12 782	3 659 817	17 656	2 544 037
75-79	7 150	3 680 020	11 041	2 458 982
80-84	3 697	3 712 489	7 185	2 426 924
85-89	1 283	3 557 295	2 775	2 414 753
90-94	398	3 584 799	1 155	2 417 212
95+	63	3 652 540	240	2 601 458
Total	65 250	3 272 026	152 815	2 483 780

Table A4.18 Invalidity average annual pensions in payment, by age and sex, December 2013 (tugrug)

	Male		Female	
Age	Number	Average amount	Number	Average amount
0-4				
5-9				
10-14				
15-19	2	205 000		
20-24	73	1 780 548	32	1 978 750
25-29	388	1 980 412	248	1 875 847
30-34	883	1 939 026	695	1 901 885
35-39	1 547	1 966 354	1 372	1 905 401
40-44	3 840	1 891 818	3 776	1 836 041
45-49	7 250	1 998 112	7 435	1 871 321
50-54	9 497	2 189 740	8 373	2 019 988
55-59	8 257	2 384 668	1 239	3 196 538
60-64	1 073	4 822 507	284	3 050 035
65-69	324	4 882 963	100	2 911 200
70-74	165	4 847 455	42	2 792 381
75-79	63	5 125 079	31	2 506 452
80-84	21	4 811 429	13	2 163 846
85-89	3	3 063 333	5	2 126 000
90-94			1	2 160 000
95+				
Total	33 386	2 272 795	23 646	2 012 087

Table A4.19 Survivors' average annual pensions in payment, by age and sex,[1] December 2013 (tugrug)

	Male		Female	
Age	**Number**	**Average amount**	**Number**	**Average amount**
0-4				
5-9				
10-14				
15-19	45	4 312 667	56	4 535 000
20-24	210	1 834 571	280	1 834 179
25-29	249	1 944 257	485	2 061 753
30-34	265	1 996 717	821	2 038 819
35-39	413	2 073 656	1 691	2 034 630
40-44	572	2 107 308	3 096	1 963 311
45-49	730	1 952 534	3 792	1 963 141
50-54	776	1 917 938	2 992	2 021 019
55-59	510	1 984 431	1 816	2 192 285
60-64	238	2 073 109	904	2 377 301
65-69	168	2 105 298	517	2 389 284
70-74	111	2 160 811	391	2 398 286
75-79	50	2 112 600	362	2 545 939
80-84	19	2 372 632	323	2 506 471
85-89	5	1 960 000	165	2 483 091
90-94	3	2 020 000	120	2 418 583
95+			31	2 698 387
Total	4 364	2 024 203	17 842	2 088 864

[1] Age and sex of the deceased.

Table A4.20 Orphans' average annual pensions in payment, by age and sex, December 2013 (tugrug)

	Male		Female	
Age	**Number**	**Average amount**	**Number**	**Average amount**
0-4	1	2 590 000		
5-9	7	2 052 857	9	1 978 889
10-14	87	1 992 184	73	1 999 452
15-19	427	1 892 084	419	1 897 542
20-24				
25-29				
30-34				
35-39				
40-44				
45-49				
50-54				
55-59				
60-64				
65-69				
70-74				
75-79				
80-84				
85-89				
90-94				
95+				
Total	522	1 912 261	501	1 913 852

4.7 Family structure

Information on the family structure of the insured population is necessary for the projection of survivors' benefits. Normally, assumptions have to be established on the probability of being married at death, the average age of spouses, the average number of orphans and their average age. Family statistics used have been derived from the information transmitted by SIGO and the NSO. Examples of the assumptions used in the study appear in table A4.21.

Table A4.21 Family statistics

	Probability of being married		Average age spouse		Average number of dependent children		Average age of the children	
Age	Males	Females	Males	Females	Males	Females	Males	Females
	%	%						
15	2.7	1.2	15	15	0.3	0.3	0.1	0.1
20	20.8	9.0	17	23	0.8	0.8	0.1	1.7
25	39.5	68.3	22	28	2.0	2.0	3.3	5.6
30	56.3	72.0	27	33	2.0	2.0	7.2	8.7
35	81.6	74.4	32	38	2.0	2.0	9.8	11.3
40	100.0	53.4	37	43	2.0	2.0	12.3	14.1
45	88.2	38.1	42	48	2.0	2.0	15.3	16.8
50	54.7	29.2	47	53	2.0	2.0	17.4	18.3
55	37.6	14.0	52	58	2.0	2.0	18.6	18.5
60	17.4	6.2	57	63	2.0	2.0	19.1	19.6
65	6.8	4.6	62	68	2.0	2.0	19.6	19.6
70	3.6	2.8	67	73	2.0	2.0	19.6	19.6
75	2.3	0.6	72	78	2.0	2.0	19.6	19.6
80	0.0	0.3	77	83	2.0	2.0	19.6	19.6
85	0.0	0.2	82	88	2.0	2.0	19.6	19.6
90	0.0	0.2	87	93	2.0	2.0	19.6	19.6
95	0.0	0.2	92	98	2.0	2.0	19.6	19.6

4.8 Return on assets

A real return on assets of 3 per cent has been used for all year of the projection.

4.9 Adjustment of pensions in payment and other parameters

Pensions have been assumed to be adjusted each year to the inflation rate.

4.10 Initial reserve

No initial reserve has been assumed.

APPENDIX 5. Concepts on the funding of social insurance

5.1 Pure assessment – pay –as you-go system

Under this financial system, the contribution rate during a given period, for example, one year (annual assessment) or a few years, is determined in such a way that income from contributions during a period will just cover the expenditure of the scheme during the same period. There is also a small margin to allow the constitution of a contingency reserve. This system is usually applied to finance short-term benefits such as sickness and maternity cash benefits. Annual benefit expenditure is expected to remain at a relatively constant level once the scheme has attained a certain maturity, unless the benefit provisions themselves have been changed. The contingency reserve enables coverage of unexpected expenditure due to temporary fluctuations of the risk factors involved. The reserve should therefore be maintained in a sufficiently liquid form so that it can be readily resorted to when necessary. If a pure assessment system were applied to a new pension scheme, it would involve frequent revisions of the contribution rate. The annual expenditure under a new pension scheme would begin at a comparatively low level and increase continuously over a long period of time. This is because there will be an increasing number of surviving pensioners. Another reason for escalating annual expenditure is that each new group of pensioners will be drawing higher rates of pension due to longer insurance periods compared to the previous generations of pensioners. Pure assessment is not appropriate for a new pension system. For a mature scheme, however, this financial system could be adopted.

5.2 General average premium system

A general average premium (GAP) system provides for a theoretically constant rate of contribution ensuring financial equilibrium *ad infinitum*. At any time, the present values of all probable future contributions income plus accumulated reserves should be equal to the present value of all probable future outlays, both in respect of the initial population and of future entrants. The contribution rate determined under this system would be relatively high and would lead to a formation of high reserves. Though theoretically constant, the contribution rate is likely, in practice, to be revised at periodic actuarial reviews. If this system were applied to a new pension scheme from the start, the rate of contribution would be relatively high and this could cause an undue burden on the economy and on the contributing parties.

5.3 Scaled premium system

It is possible to devise many intermediate systems of finance between the basically unfunded (PAYG) pure assessment system and the fully-funded GAP system. The following factors frequently lead to the adoption of an intermediate system of finance:

1. The contribution rate must not be excessive (with respect to the capacities of the members and the economy in general).
2. The initial, and any subsequent contribution rates established under the system of finance applied to the scheme, should remain relatively stable for reasonable periods of time. Increases in the contribution rate should be gradual, particularly when they are not accompanied by an improvement in benefits.

An example of an intermediate level of funding is the scaled premium system of finance. Under this system, a contribution rate is established so that during a specified period, which is known as the period of equilibrium, the contribution income and the interest income on the reserves of the scheme will, in each year, be adequate to meet the expenditure on benefits and administration in that year. In order to avoid a decrease in the reserves after the end of a period of equilibrium, the contribution rate must be revised prior to this and a new higher contribution rate applied during a new period of equilibrium. Thus, the financial equilibrium would be assured for limited periods, such as 20, 15 or ten years, within each of which the contribution rate is supposed to remain stable. Subsequently, it would be increased by stages of 20, 15 or ten years, respectively. There would be a moderate accumulation of funds, the amount of which depends on the length of the period of equilibrium. A short period of equilibrium would result in a low contribution rate, which would have to be increased rather frequently, and would bring about a low degree of accumulation of funds, thus approaching the system of annual assessment.

However, a long period of equilibrium would result in a relatively high initial contribution rate and a larger accumulation of funds, and consequently approaches the GAP system. The scaled premium system is flexible, as it permits adaptation to changes in the conditions determining the financing of the scheme. It should be emphasized, however, that the system requires periodic increases of the contribution rate, which are not accompanied by benefit improvements. Although the contribution rate during the initial period of equilibrium will be lower than that under the GAP system, eventually a stage will be reached when it will exceed the contribution rate required under the latter financial system.

5.4 A fully-funded system

A fully-funded system is a system where liabilities are fully funded. Instead of relying on younger generations of workers to pay the benefits, each generation is required to set aside enough money to pay their own benefits. At each moment during the life of the pension plan, accumulated contributions and investment income shall be enough to pay all the promises. If not, deficits should be made good during a stated period. This kind of financing system is more prevalent in the private pension world because it protects workers if the pension plan ends, whereas a public pension scheme is supposed to be in place for ever. A fully-funded scheme is also the approach that most respects the principle of intergenerational equity.

APPENDIX 6. The ILO actuarial valuation model: general methodology

This actuarial review makes use of a comprehensive methodology developed at the Financial, Actuarial and Statistical Services of the ILO for the reviewing of long term actuarial and financial status of national pension schemes. The review was undertaken by modifying the generic version of the ILO modelling tools to fit SIGO's situation. These modelling tools include a population model, an economic model, a labour force model, a wage model, a long-term benefits model and a short term benefits model.

6.1 Modelling the demographic and economic developments

The use of the ILO actuarial projection model requires the development of demographic and economic assumptions related to the general population, the economic growth, the labour market and the increase and distribution of wages. Other economic assumptions are related to the future rate of return on investments, the indexation of benefits and the adjustment of parameters, such as the maximum insurable earnings and the future level of flat rate benefits.

The selection of assumptions for projections took into account the recent experience of SIGO depending on the availability of information. These assumptions were selected to reflect long term trends rather than giving undue weight to recent experience. The detailed description of the demographic and economic assumptions is presented in Appendices 2 and 3.

6.2 General population

General population is projected starting with the most current data on the general population, and applying appropriate mortality, fertility and migration assumptions.

6.3 Economic growth and inflation

Labour productivity increases and inflation rates are exogenous inputs to the economic model. Real rates of economic growth are derived using the ILO economic projection model.

6.4 Active population and employed population

The projection of the labour force, that is, the number of people available for work, is obtained by applying assumed labour force participation rates to the projected number of people in the general population. An unemployment rate is assumed for the future, and aggregate employment is calculated as the difference between labour force and unemployment. Growth in the insured population is linked to the growth in the employed population. In this model, the insured population is projected starting with the most current data on insured participants, and then applying appropriate mortality, disability and retirement rates.

6.5 Salaries

Based on an allocation of total GDP to capital income and to labour income, a starting average wage is normally calculated by dividing the wage share of GDP by the total number of employed. In the medium term, real wage development is checked against labour productivity growth. In specific labour market situations, wages might grow faster or slower than productivity. However, due to the long term perspective of the present study, the real wage increase is assumed to gradually converge with real labour productivity. It is expected that wages will adjust to efficiency levels over time. In this model, in order to take into account the long term perspective of the actuarial valuation, the long term real wage increase is based upon a long-term assumption which is in line with assumptions observed in other actuarial valuations and a long term view of the economy.

Wage distribution assumptions are also needed to simulate the possible impact of the social protection system on the distribution of income, for example, through minimum and maximum pension provisions. Data on the wages by age and sex as well as on the dispersion of wages are used in the projection. Average earnings, which are used in the computation of benefits, are also projected.

6.6 Modelling the financial development of the social insurance scheme

The present actuarial review addresses all income and expenditure items of the long term (pension) benefits and the short term benefits. Projections for pensions are made separately for each sex. Due to the importance of SIGO's long term benefits, more detail is given in these projections.

6.7 Purpose of pension projections

The purpose of the pension model is twofold. First, it is used to assess the financial viability of the branch. This refers to the measure of the long term balance between income and expenditure of the scheme. In case of an imbalance, a revision of the contribution rate or the benefit structure is recommended. Second, the model may be used to examine the financial impact of different reform options, thus assisting policy makers in the design of benefit and financing provisions. More specifically, the model is used to develop long term projections of expenditure and insurable earnings under the scheme, for the purpose of:

1. assessing the options for building up a contingency or technical reserve;
2. proposing schedules of contribution rates consistent with the funding objective;
3. testing how the system reacts to changing economic and demographic conditions, and
4. analysing the financial impact of possible modifications to the scheme.

6.8 Pension data and assumptions

Pension projections require the demographic and macro-economic framework already described and, in addition, a set of assumptions specific to the social insurance scheme.

The database, as at the valuation date, includes the insured population by active and inactive status, the distribution of insurable wages among contributors and the distribution of past credited service and pensions in payment. Data are disaggregated by age and sex.

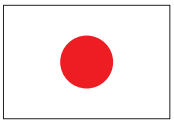
Scheme-specific assumptions, such as disability incidence rates and the distribution of retirement by age, are determined with reference to scheme provisions and the scheme's historical experience. The data and assumptions specific to SIGO are presented in detail in Appendix 2.

6.9 Pension projection approach

Pension projections are made following a year-by-year cohort methodology. The existing population is aged and gradually replaced by successive cohorts of participants on an annual basis according to the demographic and coverage assumptions. The projection of insurable earnings and benefit expenditures are then made according to the economic assumptions and the scheme's provisions.

Pensions are long term benefits. Hence, the financial obligations that a society accepts when adopting financing provisions and benefit provisions for them are also of a long term nature: participation in a pension scheme extends over a whole adult life, either as contributor or beneficiary, that is, up to 70 years for someone entering the scheme at the age of 16 years, retiring at the age of 65 years and dying some 20 or so years later. During their working years, contributors gradually build entitlement to pensions that will be paid even after their death, to their survivors.

It is not the objective of pension projections to forecast the exact progression of a scheme's income and expenditure, but to verify its financial viability. This entails evaluating the scheme with regard to the relative balance between future income and expenditure. This type of evaluation is essential, especially in the case of SIGO, which has not yet reached its mature stage.



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