Employment Injury Insurance in the Republic of Moldova

Options for contribution rates

ILO DECENT WORK TECHNICAL SUPPORT TEAM AND COUNTRY OFFICE FOR CENTRAL AND EASTERN EUROPE

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Foreword

Work accidents and occupational diseases are a serious concern for all employers, workers and the government of Moldova. Occupational safety and health (OSH) is recognized as a priority in the Decent Work Country Programme for Moldova for the period 2012–2015.

In its effort to improve the employment injury insurance system in Moldova, the Ministry of Labour, Social Protection and Family requested the ILO's technical assistance on the design of contribution rates for the employment injury insurance system which would reflect the risk of industries and provide incentives for employers' commitment to the prevention of employment injuries and collaboration for facilitating injured workers' early return to work.

This report presents options for determining the contribution rates of the employment injury insurance system in Moldova. The report was prepared by Gilles Binet, Actuarial Expert. This final report was completed under the supervision of Kenichi Hirose, Senior Social Protection Specialist, ILO Decent Work Technical Support Team and Country Office for Central and Eastern Europe (ILO DWT/CO–Budapest).

A joint mission by the Actuarial Expert and the Senior Social Protection Specialist was undertaken in March 2013 to collect data and conduct consultations with the Government and social partners. The draft report was presented at the Tripartite Meeting on Employment Injury Insurance in Moldova held on 17 September 2013 in Chisinau. The comments received by the government authorities and representatives of the social partners at the meeting have been reflected in this final report. Oxana Lipcanu, the ILO National Coordinator (ad interim) for Moldova, and her assistants, Carolina Chicus–Bodean and Virginia Badiu, provided valuable assistance throughout the conduct of the mission and the preparation of this report. Olga Dontsova and Ramona Padurean, interns at ILO DWT/CO–Budapest provided editorial assistance in finalizing this report.

This report is organized as follows. Chapter 1 provides a summary of the employment injury insurance system in Moldova. Chapter 2 provides an overview of the actuarial study and discusses general issues related to the determination of contribution rates. Chapter 3 describes the preliminary results of the estimated average contribution rates of employment injury insurance. Chapter 4 presents the determination of the contribution rates by risk groups (industry groups) under two options. Chapter 5 explains the rationale and the basic mechanism of an individual employer's experience–based rating system and discusses the issues with the implementation of such a system in Moldova. Chapter 6 summarizes the views of the social partners and concludes with the future follow up issues. Three Annexes supplement the report with explanations of detailed technical issues. Annex A provides the description of the actuarial methods for estimating the average costs of these benefits. Annex B presents an illustration of the process of calculation of the con–

tribution rates. Annex C presents case studies of the experience-based contribution rating systems in Japan and in Quebec.

We trust that this report will serve as a useful knowledge base for those concerned with the development of a better employment injury protection system in Moldova.

Budapest, November 2013

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Contents

List of Tables and Figures

Abbreviations

CNAM	National Health Insurance Company (National Health Insurance Agency; Compania Naţională de Asigurări în Medicină)
CNAS	National Social Insurance House (National Office of Social Insurance; Casa Naţională de Asigurări Sociale)
EII	Employment injury insurance
ILO	International Labour Organization
LI	Labour Inspectorate
NACE	European Classification of Economic Activities
NBS	National Bureau of Statistics
OSH	Occupational safety and health
PAYG	Pay-as-you-go

Exchange rate: 1 Euro = 17.76 Moldovan lei (MDL) (as of 04.10.2013)

Executive summary

Employment injury compensation is closely related with occupational safety and health. In order to reduce work accidents and occupational diseases, it is indispensable to create positive synergies between compensation and prevention. Properly designed risk-based contribution rating systems are generally considered an effective instrument to provide incentives for employers' commitment to prevention and raise awareness on safety and health at work.

The current Moldovan employment injury insurance system provides a basic package of medical care and cash benefits. The first 20 days of work lost due to employment injury are paid directly by employers. The remaining benefits are paid by the national health insurance system and the national social insurance system, and financed by contributions from insured workers and employers. Although the employers' share in the national social insurance contribution is higher, there are no earmarked contributions for employment injury benefits. In addition, compensation is paid by employers in case of negligence in complying with safety regulations.

The purpose of this report is to explain key characteristics of the differential rating system and experience rating system, and to analyse the issues associated with their implementation in the Moldovan context. One of the crucial questions is how to find a balance between individual liability and collective solidarity with a view to improve the financial protection of all parties and provide incentives for prevention. Due to limitation of data, estimated results are of a preliminary nature that requires further validation with more reliable data. However, the methodology and the process of the determination of contribution rates explained in this report can serve as a guide for future review.

As a prerequisite for the implementation of these measures, first, the employment injury insurance system should be transformed into a "no-fault" system which guarantees an adequate level of benefits throughout the contingency of work accident and occupational disease; and second, priority actions should be taken on improving the collection of employment injury data at the industry and enterprise levels.

To determine the contribution rate, the first step is to estimate the average contribution rate necessary to finance the employment injury benefits and administrative expenses. The preliminary results indicate that the estimated average contribution rate of employment injury benefits is 0.238 percent under the base assumption and 0.349 percent under the alternative assumption. Either result shows that the contribution rate for employment injury insurance accounts for a small portion of employers' total social security contribution rate.

Preliminary estimates of contribution rates have been established for 14 industries according to the classification currently used in Moldova. The results are presented in terms of the relative risk coefficients which represent the degree of risk of each rate group in relation to the average risk. The total of 14 risk groups consists of (i) four high-risk industries (mining and quarrying; electric

energy, gas and water; construction; and public administration and defence) with more than twice the average risk, (ii) two low-risk industries (hotels and restaurants; and education) with less than half the average risk, and (iii) the remaining eight industries whose risk levels lie within 40 percent of the average risk.

If a complete database is available which enables appropriate cost calculations, the risk group could be composed of 25 to 35 rate groups based on the updated European Classification of Economic Activities. It is important to verify that the risk assessment of each rate group is statistically credible in the Moldovan context. In case sufficient statistical data are not available in the foreseeable future, the method used by Romania could be used to complement the Moldovan experience.

Experience rating system (also referred to as the merit rating or "bonus-malus" premium system) is intended to serve as an incentive for employers to reduce both the number of workers injured and the length of lost time by encouraging the employer to establish and maintain safety and prevention programmes and to assist the worker to return to work as soon as possible. Under the experience rating system, the contribution rate of an individual employer is adjusted from the corresponding industrial rate according to the accident experience and the accident prevention measures taken by the employer.

It would be possible for Moldova to develop a prospective experience rating system for employers that meet the criterion of statistical credibility. Provided that the scope of the experience rating covers all large and medium-sized enterprises as well as certain small enterprises classified in high risk groups, it is estimated that at least 5 percent of enterprises or at least 60 percent of employees could be subject to experience rating in Moldova. Case studies of other countries are presented to serve as guidance for designing the experience rating system in Moldova.

In designing and implementing an effective experience rating system in Moldova, the country should (i) develop a solid database of employment injuries, (ii) build the capacity of the government and social security organizations, (iii) develop necessary rules and the mechanism for their enforcement, and (iv) consider the ways to extend preventive measures to all workplaces.

The tripartite stakeholders in Moldova recognize the importance of a closer link between prevention through occupational safety and health measures and compensation through employment injury insurance, although there is no agreement on the differential or experience-based contribution rates at this stage.

International experience shows that the process of implementing an experience rating system is complex and usually requires several years. It is not accomplished without strong long-term commitment and continuous efforts of the key stakeholders. Within the framework of the Decent Work Country Programme for Moldova, the ILO stands ready to provide further technical assistance as a follow up to the recommendations made in this report.

Chapter 1
The employment injury insurance system in Moldova

1.1 Overview

Globally, the form and structure of employment injury[1] protection systems vary considerably, reflecting their historical development in individual countries. The divergence across countries can be illustrated with the following two types of systems.

- On the one hand, several countries implement a mandatory no-fault compensation system administered by a public institution, which also manages prevention and inspection.
- In contrast, some countries rely on a direct employer liability system with optional insurance coverage purchased by employers from private carriers. The benefits are based on a combination of the no-fault principle and employers' negligence. Prevention is managed by a separate authority under the Ministry of Labour.

The Moldovan employment injury system covers all employees and persons undergoing professional training in Moldova. Its key characteristics are summarized as follows:

- A basic package of benefits is available to the injured worker from both the social security system and the employer based on the no-fault principle. Benefits are mainly delivered by the social security systems:
  - The costs of medical care in-kind benefits are covered by the national health insurance system administered by the National Health Insurance Company (National Social Health Agency; Compania Naţională de Asigurări în Medicină – CNAM).
  - Cash benefits for temporary incapacity are paid by the employer and the national social insurance system administered by the National Social Insurance House (National Office of Social Insurance; Casa Naţională de Asigurări Sociale – CNAS).
  - Permanent disability pensions and survivors' pensions are paid by the national social insurance system.
- In addition, compensation is paid by employers in case of negligence in complying with safety regulations. The occurrence of accidents, especially severe ones, can have a significant financial impact on small enterprises if they are found at fault.

1 In this report, the term employment injury includes work accidents and occupational diseases unless the context dictates otherwise.

- The main source of financing for health insurance and social insurance is contributions from insured workers and employers. The total contribution rate for health insurance is 7 percent, shared equally by employers and workers. The total contribution rate for social insurance is 29 percent (28 percent for the agricultural sector), of which the workers' share is 6 percent.[2] Although the employers' share in the social insurance contribution is higher, there are no earmarked contributions for employment injury benefits. Both the health insurance and social insurance systems are financed on the basis of pay-as-you-go (PAYG) under which the benefits expenditure is met by current contributions and no significant fund is set aside in advance.
- The Labour Inspectorate (LI) under the Ministry of Labour, Social Protection and Family has 81 labour inspectors who conduct about 6,000 inspections in 4,000 economic entities per year. The Labour Inspectorate plays a major role in the management of work injury claims as employers must report accidents involving more than three days of absence from work and the Labour Inspectorate must provide an opinion about whether the employer is at fault.[3] It also compiles statistics regarding work accidents and prevention interventions in the workplace.

1.2 Current provision of employment injury benefits

This section summarizes the employment injury benefits under the current legislation. The main laws are:

- Law 756/1999 on insurance for work accidents and occupational diseases (hereafter referred to as the Employment Injury Insurance Act, or simply the EII Act);
- Law 156/1998 on state social insurance pensions (referred to as the Pensions Act); and,
- Law 186/2008 on occupational safety and health (referred to as the OSH Act).

1.2.1 Medical care and rehabilitation services

According to the EII Act, workers who suffer health problems caused by work accidents or occupational diseases are entitled to a comprehensive set of medical services, including: ambulatory treatment, medical analysis and medicines, emergency medical assistance, medical services in hospitals and specialized clinics, plastic surgery and implant services, physiotherapy, transportation costs, prostheses, orthopaedic appliances and orthopaedic footwear (Article 10).

The EII Act stipulates that an individual rehabilitation programme should be developed to recover working capacity and to reduce the need for permanent care (Article 11). In addition, it stipulates that the National Social Insurance House should provide allowances for vocational rehabilitation (Article 13). However, since the National Social Insurance House does not allocate any budget for

2 It should be noted that Article 19 (2) of Law 489/1999 on the state social insurance system stipulates that insured persons who work under individual labour agreements shall pay one-third of the total contribution.

3 In case of occupational diseases, the State Supervision of Public Health is also involved in the determination of the causal link between diseases and work conditions.

the medical or vocational rehabilitation programmes, it has so far accepted only a limited number of court-ordered claims in recent years.

The costs of primary health care services (hospital and medical services) are met by the national health insurance system. Although the National Health Insurance Company has the right to recover the cost of services from the employers who are found at fault, this provision is not applied in practice. The costs of specialized medical care services that are not covered by the national health insurance system must be claimed from the social insurance system. Again, due to lack of funds, the National Social Insurance House has failed to make those payments except for court-ordered cases.

1.2.2 Temporary incapacity benefits

The cash benefit for temporary incapacity caused by work accidents or occupational diseases is granted on the basis of a medical certificate according to the EII Act (Article 14).

The amount of the benefit is 100 percent of the average monthly salary[4] of the injured worker. The benefit is paid from the first day of the incapacity up to 180 days (extendable by up to 30 additional days in justified situations) or until recovery or the award of a permanent disability pension. The first 20 days benefits are paid by the employer, and the remaining is paid by the national social insurance system.

1.2.3 Permanent disability pensions

The insured person with a disability as a result of a work accident or occupational disease has the right to a disability pension from the national social insurance system. The disability pensions are payable as long as the disability persists. The amount of disability pension depends on the assessed degree of disability (degree I: total loss of capacity for work and requiring constant attendance; degree II: total loss of capacity for any work but not requiring constant attendance; degree III: at least 40 percent loss of capacity for work).

For an insured worker who becomes permanently disabled irrespective of the cause, a disability pension is payable from the national social insurance system according to the Pension Act (Chapter II, Part 3). The amount of disability pension is calculated as a product of the career average monthly salary, the number of insurance years, and a coefficient related to the degree of disability (42 percent for degree I; 35 percent for degree II; 20 percent for degree III) (Appendix 3 of the Pensions Act). Pensions are indexed annually in line with increases in the national average salary and consumer price index.

If the disability is caused by a work accident or an occupational disease, then the EII Act provides a supplementary benefit in addition to the social insurance disability pension (Article 16). The augmented amount of work-related disability pension is 66.7 percent of the average monthly salary for disability degree I and II. For disability degree III, the percentage of loss of work capacity is also taken into account. It should be noted that according to the EII Act the work-related disability benefit refers to only the supplementary portion of benefits, namely the difference between the

4 Calculated as the average salary over the last six months preceding the month of accident.

augmented amount of work-related disability pension and the social insurance disability pension. Both benefits are administered by the National Social Insurance House.

1.2.4 Survivors' pensions and lump sum benefits

If a worker dies as a result of a work accident or an occupational disease, survivors' pensions are payable to his/her family members according to the Pensions Act (Chapter II, Part 4). The amount of survivors' pensions is determined as a percentage of the amount of disability pension for degree I.[5] The percentage is related to the number of survivors: 50 percent for one survivor, 75 percent for two and 100 percent for three or more. The eligible beneficiaries are as follows:

- children up to 18 years of age, or up to 23 years of age if they pursue full time studies in secondary, secondary specialized or higher education institutions, or irrespective of age if they are disabled;
- a surviving spouse who, at the time of death of the insured person, has attained the pension age or will attain it within five years; is disabled at degree I or II or was married for at least 15 years to the deceased and has not remarried;
- a surviving spouse who, at the time death of the insured person, does not work and is taking care of the deceased person's children younger than three years of age.

The EII Act provides lump sum benefits at the death of an injured worker (Article 18). The lump sum is a multiple of the average monthly salary of the deceased insured person which cannot be less than the national average monthly salary of the previous year. The coefficients applicable to the average monthly salary are as follows:

- the coefficient is 5 for one child, 8 for two children and 12 for three children or more;
- the coefficient is 3 for the spouse of the insured person who is disabled or has reached the pension age;
- the coefficient is 3 for a spouse or one of the parents of the deceased insured person, or any other person, who at the moment of the person's death does not work and is taking care of the deceased person's children younger than three years of age.

1.2.5 Compensation proportional to employers' fault

In addition to the above-explained benefits payable irrespective of employers' fault, the OSH Act provides that compensation is to be paid if the employer is found at fault wholly or partially of the work accident (Article 18).

In cases of permanent disability, the lump sum is the national average monthly salary multiplied by the value of percentage-points of loss of working capacity, which cannot be less than one-year's average salary of the injured worker. The benefit is reduced in proportion to the worker's fault if the worker shares the responsibility.

5 The same formula is applied for survivors' pensions regardless of whether the death is work-related or not.

In fatal cases, the lump sum is the deceased worker's average annual salary multiplied by the number of years between the worker's age at death and 62 years, which cannot be less than 10 times the annual salary of the deceased.

It was reported that almost all cases that went to court found at least some fault on the part of the employer. In many cases, the compensation is paid over several instalments. There was only one case in the past where an employer went into bankruptcy due to the court decision instructing an immediate payment of compensation in one instalment.

1.2.6 Expenditure on employment injury benefits

Table 1.1 presents the expenditure on employment injury benefits in 2011 from the budget execution report. In total, 4.6 million MDL was spent on compensation for work accidents and occupational diseases. The benefit expenditure is estimated at around 0.02 percent of estimated insurable earnings.

Table 1.1
Expenditure on employment injury benefits in Moldova, 2011

	thousand MDL
Temporary incapacity benefits	983
Permanent disability benefits	3,213
Death benefits	427
Total	4,623

Source: Nota explicativă la Raportul privind executarea bugetului asigurărilor sociale de stat în anul 2011.

1.3 Observations on the Moldovan employment injury insurance system

In the current Moldovan system, the compensation against employment injuries is managed separately from the departments in charge of labour inspection and prevention programmes. Furthermore, the regulation and administration of employment injury benefits are scattered as the benefits are stipulated in several laws and benefits are provided by employers and two social security systems.

Greater integration and effective coordination between related systems are required in order to better manage the employment injury risk and to better utilize limited resources. Since prevention and compensation are two complementary approaches to work accidents and occupational diseases, these two functions should be integrated in the institutional framework. It is widely recognized that close collaboration between occupational safety and health and the compensation system is the cornerstone of success in the reduction of work accidents and occupational diseases.

The compensation system in Moldova consists of a combination of no-fault and tort systems. However, seeking legal recourse against an employer for negligence of duty is not an effective method of gaining adequate and prompt payment of compensation, since the process is often lengthy and costly. Moreover, there is no guarantee that small or financially weak employers can pay the compensation in full, particularly when they are liable for a large amount of compensation as a result of a severe accident. The same argument applies to the element of employers' direct liability in the benefit provision, in particular the payment of the first 20 days of temporary incapacity benefits.[6] Thus, a sensible approach would be to scale down the tort system and the employers' liability system and shift them to an enhanced no-fault compensation system which provides not only adequate income security throughout the contingency of work accident and occupational disease but also comprehensive medical and vocational rehabilitation services to support injured workers return to work.

The introduction of a rating system that takes into consideration the industry and the individual employer's risk may be an opportunity to delink the compensation rules from the fault system. This would provide more predictable compensation to workers and better protection to employers against the financial consequences of accidents while creating an incentive to provide safe and healthy workplaces.

6 It should be noted that many schemes impose "waiting days" on the payment of temporary incapacity benefits in order to save benefit costs and administrative expenses for very short absences from work due to employment injury, which are to be covered by sick leave. ILO Convention No. 102 allows for three such days at the commencement of incapacity.

Chapter 2
Scope of the actuarial study

This chapter provides an overview of the actuarial study and discusses general issues related to the determination of contribution rates.

2.1 Selection of the financing system and the rating system

There exist a large number of financial systems for employment injury insurance, ranging from PAYG system to full-funding systems and a wide range of intermediate ones. In order to collect contributions sufficient to cover all current and future costs related to claims occurring in any year, a widely adopted financing system for employment injury insurance consists of applying PAYG system for short-term benefits (temporary incapacity benefits, medical care and rehabilitation programmes) and full-funding systems for long-term benefits (permanent disability and survivors' pensions). In particular, the terminal funding system is normally used to finance long-term benefits. Under this system, a contribution equal to the present value of a pension is paid at the award of the pension and set aside as a reserve for the future benefit payments.

The risk of employment injury varies widely among different economic activities. Furthermore, the exposure to risk within the same economic activity can differ between enterprises because of different standards of safety conditions. Prevention activities and the commitment of employers and workers to the early return to work of injured workers will also have an impact on the experience of individual employers. The rating systems aimed at pricing employers more or less responsive to their risks are also diversified. This report examines three options of setting contribution rates of employment injury insurance: uniform rates, differential rates by industry, and experience rates.

The current Moldovan employment injury insurance system *de facto* adopts PAYG financing with a uniform rate.[7] With a view to enhancing fairness and equity of the system, it is recommended that Moldova should consider the adoption of the full-funding financial system at least for the long-term benefits. Concerning the selection of the rating system, the following factors should be taken into consideration:

- the degree of integration of the employment injury insurance system with other branches of the social security system;

7 It should be noted that the contribution rate of the employers in the agricultural sector is one percentage-point lower than the employers in other sectors.

- the extent of cross-subsidization among industries;
- the need to promote prevention; and
- the administrative capacities of the institution.

2.2 Options for setting contribution rates

With respect to the rating system, the Ministry of Labour, Social Protection and Family is considering shifting from the current uniform rates to those that take into account the risk of industries and the behaviour of individual employers regarding occupational safety and health. The following chapters present three options of increasing complexity for setting contribution rates.

The first step is to estimate the average contribution rate necessary to finance employment injury benefits and administrative expenses in the year. This provides an important piece of information because there are no earmarked contributions for financing employment injury benefits in Moldova. Under the reformed rating system, the average employment injury insurance contribution rate should be deducted from the current health insurance and social insurance contribution rates. Then, the employment injury insurance contribution rates according to the specific rating system will be levied on the employers.

The next step is to present the instruments and methods to determine the contribution rates according to the employment injury risk of industries. The results are presented in terms of risk coefficients relative to the average contribution rate.

In the last step, we explain the method of adjusting the contribution rates of individual employers according to the accident experience and the accident prevention measures taken by the employers.

It should be noted, however, that since the current database on the Moldovan system is incomplete at the time of writing this report, it was not possible to carry out sound estimates of contribution rates based on actuarial principles. Therefore, in this report, the emphasis is placed on the description of the methodology and the process for the determination of assumptions.

2.3 Assessment periods and the frequency of review

To estimate contribution rates, assumptions on the incidence rates and the average costs should be made based on the statistical data of the most recent years.[8] Although these assumptions should be made as objectively as possible, one should exercise judgment in dealing with the past statistical data. For example, when the experience is stable and the use of an average over

8 The degree of complexity for the determination of these assumptions varies by type of benefits. For example, the evaluation of the average costs of disability and survivors' pensions involves long-term assumptions on rates of interest and pension indexation and mortality rates.

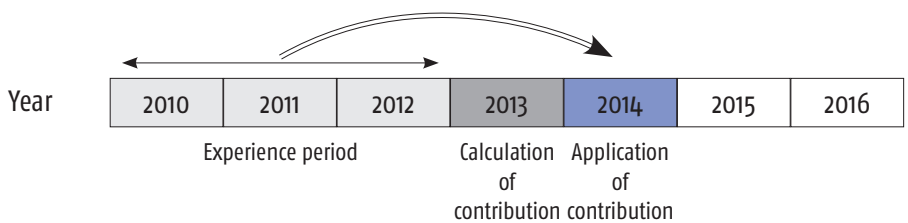
a certain number of years is reasonable, the question is the length of the past period over which the average should be taken. The answer depends on the balance between the need to optimize statistical credibility and the desirability of using the most recent experience. A range of three to five years is commonly taken. When the experience shows upward or downward trends, then the issue is whether this trend is assumed to continue, reverse or stabilize. There is no automatic answer to this question. Generally speaking, prudence is advisable and the use of reasonable margins avoids the occurrence of undesirable deficits.

The frequency of the review of contribution rates is also an important element to consider. Annual calculations allow prompt reactions to the evolving experience. If it is not possible to implement the annual review immediately due to administrative constraints, it should be put in place through a transition period during which contribution rates are reviewed every two or three years.

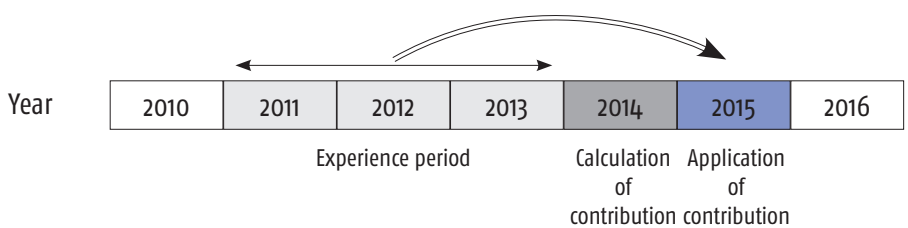
In this way, the determination of the contribution rates for employment injury insurance is made on a continual basis by taking into account the most recent experiences of incidence and severity of work accidents and occupational diseases. Figure 2.1 illustrates the time schedule for contribution rates determined annually using the data of the three most recent years.

Figure 2.1
Time schedule – annual review based on data of the past three years

a. Contribution rate applicable for 2014



b. Contribution rate applicable for 2015



Chapter 3
Estimation of the average contribution rate

This chapter describes the methodology, assumptions and preliminary results for the calculation of the average contribution rate. Detailed technical information is summarized in Annexes A and B of this report.

3.1 Methodology

The basic formula for the calculation of the contribution rate is to set it equal to the sum of the expected benefit costs and expected administrative expenses expressed as a percentage of the expected insurable earnings.

As noted in the previous chapter, the recommended financial system for the Moldovan employment injury insurance is a combination of PAYG for short-term benefits and terminal funding for long-term benefits. Under this financial system, the scope of the benefit costs to be met by the contributions in a given year covers the following (see Table 3.1):

- the costs of medical care and rehabilitation services in the year;
- the temporary incapacity benefits in the year;
- the *present value* of permanent disability pensions awarded in the year;
- the *present value* of survivors' pensions awarded in the year; and
- the lump sums for fatal cases in the year.

Table 3.1
Scope of liabilities of the employment injury insurance in Moldova

	Legal basis	Costs of benefits directly paid by	Covered by EI contributions
Medical care	EII Act	Health insurance system	Yes
Special medical care and rehabilitation	EII Act	Social insurance system	Yes

Temporary incapacity benefits (first 20 days)	EII Act	Employers	Yes (from 4th to 20th day)
Temporary incapacity benefits (from 21st to 180th day)	EII Act	Social insurance system	Yes
Permanent disability pensions	Pensions Act	Social insurance system	Yes
Permanent disability pensions (supplementary for work-related cases)	EII Act	Social insurance system	Yes
Survivors' pensions	Pensions Act	Social insurance system	Yes
Survivors' lump sums	EII Act	Social insurance system	Yes
Compensation for the fault of the employer	OSH Act	Employers	No
Administrative expenses	—	Social and health insurance systems	Yes

The following remarks are in order:

- All the above items concern benefits and administrative expenses related to work accidents and occupational diseases. In particular, the temporary incapacity benefits include the payments of the first 20 days of absence from work paid directly by employers (except for the first three-day waiting period), while the disability pensions include both general disability pensions and complementary work-related disability pensions.
- Currently, the costs of medical care and rehabilitation services paid by the National Social Insurance House according to the EII Act are limited. There is a need to develop a mechanism to identify the costs of medical care and rehabilitation services and to bill them to the employment injury insurance system. Though developing such mechanism may not be possible in the short-term, it is necessary to consider the potential impact of such a refinement in the present analysis.
- Certain medical care benefits, such as drugs and prostheses, may incur costs for the lifetime of injured workers. Therefore, their payment pattern would suggest using the full-funding system. Although this may not be relevant in the current context, it may be necessary to review the proposed approach if the situation changes in the future.
- In addition, the long-term liability with respect to the current disability and survivors' pensioners should be financed separately. In view of the financial situation of the National Social Insurance House, the implications of the transition costs should be recognized.

Annex A of this report describes the actuarial methods for estimating the average costs of these benefits.

3.2 Preliminary estimation results

The quality of actuarial estimates depends on the quality of data that are available. A complete database allows properly analyzing the past experience and establishing the assumptions with confidence. Assumptions are not predictions of what will happen in the future, but a reasonable basis to make actuarial estimates. Observed results unavoidably deviate from the estimates and a financing policy should formulate the actions to be taken when significant surpluses or deficits occur.

Annex B of this report presents the illustration of the process of calculation of the contribution rates. It attempts to make assumptions based on the analysis of the collected statistical data in Moldova. Although aggregate data on the employment injury benefits were available, the incompleteness and inconsistency of the dataset made it difficult to construct reasonable assumptions which feed into the estimation of contribution rates based on the methods described in Annex A. In particular, the incidence rates of temporary incapacity benefits based on the Moldovan data for the period 2008–2010 have been discretionarily augmented by certain factors with a view to correct the impact of under-reporting. Furthermore, due to lack of sex and age disaggregated data, a simplified approximation was used for estimating the costs of permanent disability and survivors' pensions.

Given these limitations of actuarial bases, the results of the actuarial estimation do not fully reflect the Moldovan situation. Nonetheless, it would be instructive to use concrete quantitative data to illustrate the process of calculation of the contribution rates. These figures should be regarded only as a preliminary indication of the possible level of the contribution rate, and therefore interpreted with caution. It is strongly recommended that in the next review all assumptions should be carefully revised based on further analysis of the data in order to ensure their reliability and completeness.

Table 3.2
Preliminary estimates of the average contribution rates of the employment injury insurance system in Moldova

	Base assumption	Alternative assumption
Benefit costs	0.196	0.292
Administrative expenses	0.029	0.044
Current pensioners' liabilities (amortized over 25 years)	0.013	0.013
Total contribution rate	0.238	0.349

Table 3.2 presents the preliminary results of the estimated average contribution rates of the employment injury insurance system in Moldova. Two sets of results are presented. The base assumption represents the best estimates based on the available data but with the above-mentioned ad-

justments of unobservable under-reporting effects. The alternative assumption takes into account additional margins in the incidence rates. With the above-mentioned disclaimer, the preliminary results indicate that the estimated average contribution rate for employment injury benefits is 0.238 percent under the base assumption and 0.349 percent under the alternative assumption. Either result accounts for a small portion of the employers' total social security contribution rate, namely 3.5 percent for national health insurance and 23 percent (22 percent for the agricultural sector) for national social insurance.

Chapter 4
Differential contribution rates by industry

Given that the employment injury risk varies by economic activity, employers may be classified into groups according to their risk characteristics for the purpose of contribution rate assessment. Specific rates are set for each class of employers.

This chapter presents the risk-based contribution rates in Moldova. The first option is based on the Moldovan experience. Since the size of the exposure at risk is small in several industries, a second option referring to the Romanian system is examined.

4.1 Classification of employers

Differential rating requires a system which classifies employers into groups with similar risk characteristics. The classification system must achieve the optimal balance between conflicting objectives of equity and statistical credibility. Equity suggests that one should define as many groups as necessary in order to reflect the proper costs. However, it is necessary that the number of employees in a particular industrial classification be sufficiently large to adequately spread the risk and provide a basis for assessing the contribution rate of employers. The larger the pool of risks (risk group) the more stable is the claims experience and hence a contribution rate can be set with greater confidence and less volatility. A classification system should be adapted to the changing environment. New risks and safer methods of operations must be recognized properly to ensure equity and acceptance of the system by employers.

Another important element to be considered in the composition of groups is to optimize the possibility for the employers to collaborate in order to reduce the risks in their sector of activity and collectively benefit from their investment in prevention by future contribution rate reductions as the experience improves. Similar incentives for collaboration on facilitating injured workers' early return to work should also have positive effects on contribution rates.

The classification system used for national labour statistics is widely used worldwide. In Moldova, the statistical classification of economic activities in the European Community, called NACE[9] Rev. 1.1, is used by the National Bureau of Statistics, social security organizations and the Labour Inspector-

9 NACE is the acronym for "Nomenclature statistique des activités économiques dans la Communauté européenne".

ate. Therefore, it would be reasonable to use it as a base to elaborate the classification system for employment injury contribution rate setting. It should be noted, however, that grouping in the statistical classification system does not fully reflect the similarity of employment injury risks and adjustment is sometimes necessary.

Since 2008, NACE Rev. 2 has been available and Moldova is considering the adoption of this new version. As indicated in Tables 4.1 and 4.2, in NACE Rev. 2, four sections of NACE Rev. 1.1 have been subdivided into two or more sections, and the fishing section has been integrated with the agriculture and forestry section.

Table 4.1
Comparison of the classification levels of NACE Rev. 1.1 and NACE Rev. 2

	NACE Rev. 1.1	NACE Rev. 2
Sections	17	21
Divisions	62	88
Groups	224	272
Classes	514	615

Source: Eurostat Methodologies and Working Papers, NACE Rev. 2 Statistical classification of economic activities in the European Community, 2008, p.48.

Table 4.2
Correspondence between the sections of NACE Rev. 1.1 and NACE Rev. 2

NACE Rev. 1.1		NACE Rev. 2	
Section	**Description**	**Section**	**Description**
A	Agriculture, hunting and forestry	A	Agriculture, forestry and fishing
B	Fishing		
C	Mining and quarrying	B	Mining and quarrying
D	Manufacturing	C	Manufacturing
E	Electricity, gas and water supply	D	Electricity, gas, steam and air conditioning supply
		E	Water supply, sewerage, waste management and remediation activities
F	Construction	F	Construction
G	Wholesale and retail trade: repair of motor vehicles, motorcycles and personal and household goods	G	Wholesale and retail trade: repair of motor vehicles, motorcycles and personal and household goods
H	Hotels and restaurants	I	Accommodation and food service activities

Table 4.2 (continued)
Correspondence between the sections of NACE Rev. 1.1 and NACE Rev. 2

I	Transport, storage and communication	H	Transportation and storage
		J	Information and communication
J	Financial intermediation	K	Financial and insurance activities
K	Real estate, renting and business activities	L	Real estate activities
		M	Professional, scientific and technical activities
		N	Administrative and support service activities
L	Public administration and defence, compulsory social security	O	Public administration and defence, compulsory social security
M	Education	P	Education
N	Health and social work	Q	Human health and social work activities
O	Other community, social and personal services	R	Arts, entertainment and recreation
		S	Other service activities
P	Activities of private households as employers and undifferentiated production activities of private households	T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
Q	Extraterritorial organisations and bodies	U	Activities of extraterritorial organisations and bodies

Source: Eurostat Methodologies and Working Papers, NACE Rev.2 Statistical classification of economic activities in the European Community, 2008, p.47.

The following is an illustration of levels of classification in NACE Rev. 1.1:
Section (K): Real estate, renting and business activities.
Division (71): Renting of machinery and equipment without operator and of personal and household goods.
Group (71.2): Renting of other transport equipment.
Class (71.23): Renting of air transport equipment.

Table 4.3 presents the number of enterprises and employees by industry in Moldova. Analysis of the data indicates that this aggregate grouping provides reasonable grounds to establish relative risk coefficients provided that the fishing should be combined with the agriculture and forestry, as has been done in NACE Rev. 2. It should be noted that the enterprise data in Table 4.3 do not include the public administration and defence sector, and that the number of enterprises in the education sector appears to be under-represented in comparison with the employee data.

Table 4.3
Number of enterprises and employees by industry in Moldova, 2011

Industry	NACE section code		Enterprises*		Employees	
	Rev. 1.1	Rev. 2	Number	Share	Number	Share
Agriculture, forestry and fishing	A, B	A	2,540	5.2%	60,117	8.2%
Mining and quarrying	C	B	116	0.2%	3,017	0.4%
Manufacturing	D	C	5,039	10.4%	102,133	13.9%
Electricity, gas and water supply	E	D, E	225	0.5%	17,770	2.4%
Construction	F	F	2,686	5.5%	27,780	3.8%
Wholesale and retail trade	G	G	19,837	40.9%	111,045	15.1%
Hotels and restaurants	H	I	1,516	3.1%	14,232	1.9%
Transport, storage and communications	I	H, J	3,281	6.8%	57,312	7.8%
Financial intermediation	J	K	857	1.8%	17,636	2.4%
Real estate, renting and business activities	K	L, M, N	7,985	16.5%	55,372	7.5%
Public administration and defence	L	O	N.A.	N.A.	51,265	7.0%
Education	M	P	352	0.7%	122,524	16.6%
Health and social work	N	Q	782	1.6%	66,543	9.0%
Other community, social and personal service activities	O	R, S	3,325	6.8%	29,724	4.0%
Total			48,541	100.0%	736,470	100.0%

Source: National Bureau of Statistics of the Republic of Moldova, Statistical databank, "Activity of economic units by kind of activity", and "Number of employees by economic activities".

Notes: The statistics on enterprises do not include public administration and defence.

4.2 Differential rates based on the Moldovan experience

Under the differential rating system, each risk group is considered as an autonomous financial unit. Statistics and accounting data are compiled separately for each risk group, which permits the setting of contribution rates that are sufficient to ensure the financial equilibrium of the group. The results are presented in terms of the relative risk coefficients which represent the degree of risk of each rate group in relation to the average risk.

The process for determination of relative risk coefficients is similar to that used for the determination of the average contribution rate with appropriate adjustments to consider the statistical credibility of each rate group. For instance, the impact of large claims is averaged out in the calculation of relative risks as they cause significant statistical fluctuations in small-sized groups (e.g., the first 10,000 MDL of a claim is recognized at 100 percent, the next 10,000 MDL at 75 percent, the next 10,000 MDL at 50 percent and so on). These parameters (claims limits and co-insurance factors) are determined so that they achieve an optimal balance between recognition of each group's risk and stability of rates over time.

In order to give an illustration of the potential range of relative risk coefficients based on the statistics for the period 2009-2011, a simplistic estimate using the incidences of temporary incapacity and of fatal cases has been made. The temporary incapacity incidence is a good indicator of frequency of accidents while the fatal cases may provide a good indication of the severity by industry. Both frequencies have been combined with a larger weight given to the fatal cases incidence in order to recognize the impact of severity.

Table 4.4 presents the resulting relative risk coefficients for the 14 risk groups. The table also indicates the contribution rate for each group calculated by applying the coefficient to the average contribution rate.

From Table 4.4 the following observations are made:

- The total of 14 risk groups are divided into (i) four high-risk industries (namely, mining and quarrying; electric energy, gas and water; construction; and public administration and defence) with more than twice the average risk, (ii) two low-risk industries (namely, hotels and restaurants; and education) with less than half the average risk, and (iii) the remaining eight industries whose risk levels lie within 40 percent of the average risk.
- Some of these preliminary results require further validation. The risk of public administration and defence in Moldova appears to be much higher than international experience (which may be due to the high claim rates in particular by the defence personnels). The reverse is observed for the hotel and restaurant industry, which usually exhibits risk close to the average risk and higher than the financial sector. Also, the risk of the financial sector appears to be high compared to international experience.

Table 4.4
Preliminary estimates of the relative risk coefficients by industry in Moldova

	Relative risk coefficients	Contribution rates (as a % of insurable earnings)	
		Base	Alternative
Agriculture, forestry and fishing	1.4	0.33	0.49
Mining and quarrying	3.0	0.71	1.05
Manufacturing	1.1	0.26	0.38
Electricity, gas and water supply	2.3	0.55	0.80
Construction	2.6	0.62	0.91
Wholesale and retail trade	1.0	0.24	0.35
Hotels and restaurants	0.2	0.05	0.07
Transport, storage and communications	1.2	0.29	0.42
Financial intermediation	0.8	0.19	0.28
Real estate, renting and business activities	0.6	0.14	0.21
Public administration and defence	2.4	0.57	0.84
Education	0.1	0.02	0.03
Health and social work	0.6	0.14	0.21
Other community, social and personal service activities	0.6	0.14	0.21

With a view to refining these results, the possibility of subdivision of certain sectors is investigated. The following remarks are made:

- Among the four high-risk groups, it would be difficult to split the mining and quarrying, and the electricity, gas and water, due to their small sample size.
- Depending on the size, the defence sector could be dealt with separately from the public administration. Usually the compensation of employment injuries of military personnels is treated by a separate scheme which is often subsidized by the state budget.
- The education sector has the largest share of labour force, but its risk is small. As this group is considered to be a homogeneous risk group, subdividing this group into several groups would have a limited impact on equity.
- The manufacturing sector consists of several homogeneous groups. Thus it would be possible to subdivide this group into approximately five risk groups. A similar scenario can be envisaged for the wholesale and retail trade sector.

- The NACE Rev. 2 also provides some ground for the subdivision of some sectors, in particular, the transport, storage and communications sector and the real estate, renting and business activities sector.

In Moldova, it would be feasible to classify the employers into 25 to 35 risk groups for which the determination of rates would be made on actuarial principles. Rates in groups with little volume of exposure could deviate significantly from the true risk. More detailed data by sectors on work accidents must be collected to formulate a concrete proposal corresponding to the approach presented in this section.

4.3 Adoption of the Romanian rating system with modifications

Although the rate-setting system described in the previous section is a recommended option, its feasibility remains to be determined. This should be clarified by the end of 2013 for the setting of contribution rates for 2015. In case sufficient statistical data are not available within this deadline, an alternative approach is examined which employs the rate setting system used in other countries with suitable modifications.

For this purpose, among the Eastern European countries comparable with Moldova, Romania has been chosen as a reference country in view of its proximity and the fact that its employment injury insurance system sets the contribution rates according to risk of industries.[10] This section presents a brief description and analysis of the Romanian employment injury insurance rating system and assesses whether and how it could be applicable to the Moldovan situation.

The Romanian rating system is stipulated in Government Decision No. 144/2008 concerning the methodological standards for calculating the insurance premium for work accidents and occupational diseases.

In Romania, employers are classified into 609 classes in line with NACE Rev. 2. For each class of employers, a contribution rate is determined based on the following four frequency indices (expressed per 1000 employees):

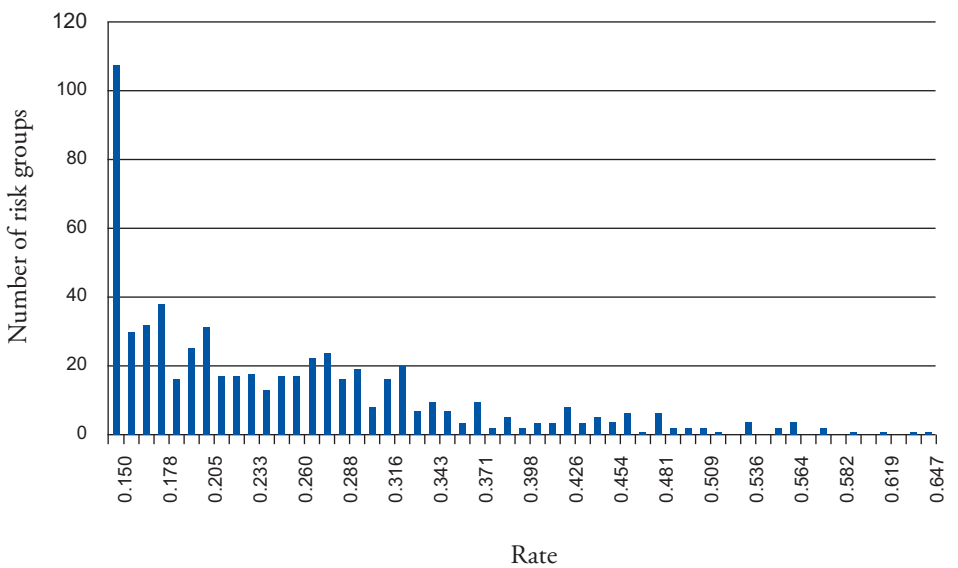
- (I_1) the number of work accidents;
- (I_2) the number of disability and fatal cases;
- (I_3) the number of occupational diseases;
- (I_4) the number of employees in special and hazardous conditions.

10 For example, Australia, Canada and New Zealand have employment injury insurance systems which adopt risk-based rating systems according to actuarial techniques and detailed information on contribution rate calculation is available. For further information, see: http://www.workcover.nsw.gov.au/formspublications/publications/Documents/ipo_actuarial_report_june_2011_3687.pdf, http://www.wsib.on.ca/files/Content/Files2013PremiumRatesManual/2013PremiumRatesManual.pdf, http://www.acc.co.nz/about-acc/levies/current-years-levy-rates/levy-risk-groups-2013-2014/index.htm.

Data of the most recent three years are used for the assessment of these frequency indices (e.g., the 2013 rate setting refers to the 2009–2011 data).

For each of the above four frequency indices, the value of the risk class (denoted by CR_1–CR_4, respectively) is defined[11] between 1 and 20. The average of these values is the overall risk class (CR) of the industry class concerned. As a result, there are 55 levels of overall risk class from 1.00 to 14.50 by a step of 0.25. For each of 609 NACE Rev. 2 industrial classes in Romania, the contribution rate (TR) is determined in proportion to its risk class. Contributions rates vary linearly from 0.150 percent for risk class 1.00 to 0.657 percent for risk class 14.50.[12] Figure 4.1 presents the number of industrial classes (risk groups) by contribution rate.

Figure 4.1
Number of risk groups by contribution rate in Romania, 2009



The above distribution has the mode at the lowest rate of 0.150 percent, and its median at 0.224 percent. Its average is estimated at around 0.25 percent (though one should take the weighted average with respect to insurable earnings of each group, the simple average is used as a proxy). The distribution has a long tail and the highest contribution rate is assigned to "Casting of steel" (NACE Rev. 2 code 24.52).

One advantage of the Romanian system is its simplicity. It allows one to establish contribution rates for 609 industrial classes of NACE Rev. 2 without requiring data on claims costs. However, although the labour force of Romania is nearly seven times larger than that of Moldova, it is not clear whether the volume of Romania data can be sufficient to set its level of risk with confidence for all risk groups.

11 Appendix 1 of this Government Decision provides a matrix transforming a frequency index into a class of risk.
12 In formula, $TR = [0.037 \times CR + 0.113]/100$, where $CR = [CR_1+CR_2+CR_3+CR_4]/4$ and $1 \le CR_i \le 20$ $(i=1,2,3,4)$.

Assuming the same salary level for all industries, the technique used to estimate the relative risk coefficients using Moldovan data in the previous section is more or less equivalent to the Romanian system using only the first two frequency indices (i.e., I_1 and I_2). Thus, the effects of other frequency indices (i.e., I_3 and I_4) may result in some deviation from the results presented in Table 4.4. Although the technical details are not available, it may be possible that the frequency index I_4 leads to overestimating the risks of certain groups as the impact of high risk industries is already captured by indices I_1 and I_2.

A possible use of the Romanian rating system for Moldova is to complement the methodology presented in the previous section. First, the contribution rates are determined for the risk groups with statistical credibility (e.g., 14 sections of NACE as indicated in Table 4.3) based on the Moldovan data. Next, the possibility of subdivision of each risk group should be examined. Then, the Romanian system can be applied to determine the contribution rates for the subgroups. A modification with the use of different weights in the calculation of the overall risk class of four frequency indices could be considered (i.e., larger weights for I_1 and I_2 than for I_3 and I_4). It is important to verify that the risk assessment of each rate group is statistically credible in the Moldovan context. Furthermore, because of its simplicity, one could consider using this system for individual employer's experience rating with suitable adjustments depending on the size of the employer. Further investigation is needed to determine the feasibility of using the Romanian rating system for individual employer's experience rating in Moldova.

Chapter 5
Experience rating system

Experience rating is intended to create an incentive for employers to reduce both the number of workers injured and the length of lost time by encouraging the employer to establish and maintain safety and prevention programmes and to assist the worker to return to work as soon as possible.

This chapter explains the rationale and the basic mechanism of an experience-based rating system for individual employers and discusses the issues with the implementation of such a system in Moldova.

5.1 Characteristics of experience rating

Under the experience rating system (also referred to as the merit rating or "bonus-malus" premium system), the contribution rate of an individual employer is adjusted from the standard rate applicable to the industry group to which the employer belongs.

Adjustments of the contribution rate can be made prospectively or retrospectively. Under the prospective approach future contribution rates are adjusted through discounts or surcharges according to the past experience of the employers in comparison with that of their industry risk group. Although employers' contribution rates must be responsive to experience, the magnitude of discounts and surcharges must bear a reasonable relationship to employers' experience variations, taking into consideration their size.[13]

Under the retrospective approach, on the other hand, each employer pays the contribution rate set for their industry in the first place. Following the closure of the fiscal year, retrospective refunds or surcharges are made based on the employer's actual claims after a certain deferment period. In order to avoid excessive differences between the initial contribution rate and the final charges, an appropriate insurance mechanism must be included in the design of the rating system. Retrospective plans based on past experience may be restricted to establishments over a certain size. Since the financial incentive through the experience rating system is not available for many small-sized and all micro-sized enterprises, other measures would need to be put in place to support their effort to improve workplace safety.

13 The range of variation of contribution rates differs by country. As explained in Annex C, in the Japanese system, the contribution rates are adjusted within the range of 40 percent in general cases. However, the maximum range of adjustment is 35 percent for the forestry sector, and 30 percent for construction projects. In Quebec, an upper limit of surcharge is set at 3 times the contribution rate, but no limit is set for discount.

Supporters of experience rating assert that this rating system results in a more equitable distribution of compensation costs among employers, and creates an incentive for prevention programmes and a stimulus for claims management programmes. Opponents argue that experience rating compromises the collective solidarity in social security, encourages employers to control costs after an injury has occurred through under-reporting, diverts attention away from accident prevention to claims cost control, increases litigation and generates additional administrative expenses. As there has been little statistical evidence demonstrating the effectiveness of experience rating, it is likely that the debate will continue.

Experience rating systems require reliable databases pertaining to each employer and advanced tools for the billing of individual employers. They also generate the need for more or better-trained staff in the administrative body, which entails higher administrative costs for the system. In theory, a more sophisticated system can create better incentives for prevention and an increased number of workers returning to work, although the costs of administering the system will be higher. However, if higher administrative costs can be offset by a reduction in the total cost of employment injuries, then the experience rating system can be considered appropriate. This trade-off is not automatic and in order to achieve the desired result, the policy and its implementing strategy need to be carefully designed in view of the country's administrative capacity.

It should be noted that although experience rating systems share common objectives and aim at respecting actuarial principles, their detailed design is quite diversified across countries. The diversity responds to diverging strategies to find the best compromise between conflicting objectives regarding the complexity dictated by the search for equity through refined actuarial techniques and the advantages of simplicity in the rate formula for administrative and communication purposes. Concrete examples, Annex C presents the experience rating systems in Japan and Quebec.

5.2 Issues with a possible introduction of experience rating in Moldova

It can be said that employers in Moldova are already exposed to some experience rating as they are individually liable for the payment of the first 20 days of temporary incapacity benefits due to employment injuries and for additional compensation if they are found at fault. In this sense the implementation of an experience rating system could be regarded as a continuation of the current arrangements.

It would thus be possible for Moldova to develop a prospective experience rating system for employers that meet the criterion of statistical credibility. Furthermore, the magnitude of adjustments of the contribution rates should be related to individual employer's claim experience and their statistical credibility. Case studies explained in Annex C or the Romanian system described in section 4.3 can serve as guidance for designing the Moldovan experience rating system.

Table 5.1 presents the number of enterprises by size. Although this table does not appear to capture all enterprises (for instance, data on the public administration and defence is missing and the

education sector seems under-represented), it can still provide useful information to assess the number of employers that could be subject to experience rating. The criteria of classification of the size of enterprises are given in Table 5.2.

Table 5.1
Number of enterprises by size in Moldova, 2011

	Large	Medium	Small	Micro	Total
Agriculture, forestry and fishing	64	235	867	1,374	2,540
Mining and quarrying	7	18	29	62	116
Manufacturing	208	265	1,138	3,428	5,039
Electricity, gas and water supply	35	16	48	126	225
Construction	81	125	731	1,749	2,686
Wholesale and retail trade	451	378	3,366	15,642	19,837
Hotels and restaurants	12	31	300	1,173	1,516
Transport, storage and communications	66	108	797	2,310	3,281
Financial intermediation	30	18	98	711	857
Real estate, renting and business activities	130	185	1,251	6,419	7,985
Education	3	15	68	266	352
Health and social work	89	47	133	513	782
Other community, social and personal service activities	28	61	368	2,868	3,325
Total	1,204	1,502	9,194	36,641	48,541
Distribution of enterprises	2%	3%	19%	75%	100%
Distribution of employees	42%	18%	23%	17%	100%

Source: National Bureau of Statistics of the Republic of Moldova, Statistical databank, Activity of Economic Units by kind of activity, size of enterprise.

Provided that small and micro-sized employers will be excluded as their statistical credibility is too low, it is assumed that the scope of the experience rating covers all large and medium-sized enterprises as well as certain small enterprises classified in high risk groups. From Table 5.1, it is estimated that at least 5 percent of enterprises or at least 60 percent of employees could be subject to experience rating in Moldova. By industry, the number of large and medium-sized enterprises is relatively high in: manufacturing; wholesale and retail trade; real estate, renting and business activities; and health and social work.

Table 5.2
Description of the size of enterprise

Category	Number of employees	Amount of sales (million MDL)	Amount of assets (million MDL)
Micro	Less than 10	Less than 3	Less than 3
Small	Less than 50	Less than 25	Less than 25
Medium	Less than 250	Less than 50	Less than 50
Large	250 or more	50 or more	50 or more

In designing and implementing an experience rating system in Moldova, the country should meet the following conditions in order for the rating system to achieve its aim of reducing employment injuries and hence improving safety and health at the workplace.

First, the experience rating system requires detailed data by individual employers which are currently unavailable in Moldova. Given under-reporting of work accidents and lack of notification of occupational diseases, the lack of a reliable database is a particular problem with employment injury insurance. Thus, a solid database of employment injuries will need to be developed as a prerequisite for the implementation of the experience rating system and also for improving the industry rating system.

Second, the capacity of the government and social security organizations should be built in order to implement the experience rating system efficiently. At the same time, employers and workers should be adequately informed of the implementation of the experience rating system and its impact on their future contribution rates.

Third, the implementation of an experience rating system requires a set of rules. For example, provisions are needed to prevent avoidance of surcharges by employers through closures and reopening of enterprises under a different legal umbrella. Certain types of claims such as long latency occupational diseases deserve special attention in their use for individual rate purposes and adequate rules must be put in place. It is also well known that the success of experience rating is strongly related to the ability of the competent authority to enforce the rules regarding the reporting of employment injuries.

Fourth, as a large majority of small-sized enterprises and all micro-sized enterprises (both of which account for 95 percent of enterprises in Moldova) as well as self-employed workers are not eligible to receive the financial incentive through the experience rating system, other measures would need to be put in place to extend preventative measures to cover all workplaces, which can possibly be subsidized from the contributions or the state budget.

Chapter 6
Conclusion

6.1 Views of social partners

The Ministry of Labour, Social Protection and Family envisages the implementation of differential contribution rates in 2015, and the subsequent implementation of experience rating at a later stage. For this process, efforts should be made to build a well-informed national consensus with the social partners. The following summarizes the views of the representatives of trade unions and employers' organizations expressed at the consultation with the ILO experts.

6.1.1 National Trade Union Confederation of Moldova

According to the trade union representative, the transition from the legal framework of the Soviet period to one harmonized with EU legislation is slow. Although there are good occupational safety and health practices by some foreign companies, the investment in prevention is generally low, at less than two euro per month per employee.

The trade union representative considers that the current contribution rate structure does not encourage employers to invest in prevention and that the contribution rate for employment injury benefits should be increased to include the benefits made directly by employers in the current system.

The trade union representative believes that statistics on conditions in workplaces are under-reported because of the significantly low figures compared to neighbouring countries such as Romania and the Russian Federation.

Trade unions participate in the investigation of severe injury and fatal cases. It was reported that since 2011 trade unions have been permitted to conduct workplace audits financed by membership fees.

6.1.2 National Confederation of Employers of Moldova

The main concern of the employers is that they have to be liable for the costs of both prevention and compensation. They would prefer to pay contributions to the employment injury insurance system and not be held liable for compensations if they are at fault.

The employers' organization representative does not believe that under-reporting is significant in the formal sector. The problem of under-reporting is prevalent in the informal economy.

The employers' organization representative agrees with the concept of rate differentiation by industry and individual experience rating of employers, but there is a concern that high-risk industries would be reluctant while low-risk industries would favour adopting such a system.

There is good collaboration between employers and labour inspection at the policy and coordination levels, but there is dissatisfaction with the field operations. The perception is that inspectors in the field do not emphasize collaboration but tend to impose punishment.

6.2 Conclusion and the way ahead

In order to reduce work accidents and occupational diseases, it is indispensable to create positive synergies between compensation and prevention. Linking contribution rates of the employment injury insurance with industry risks or individual employers' accident experience is considered an effective instrument to provide incentives for employers' commitment to prevention and raise awareness on the safety at work.

The tripartite stakeholders in Moldova recognize the importance of a closer link between prevention through occupational safety and health measures and compensation through employment injury insurance, although there is no agreement on the differential or experience-rated contribution rates at this stage.

This report has presented the key characteristics of the differential rating system and experience rating system, and analyzed the key issues associated with their implementation in the Moldovan context. One of the crucial questions is how to find a balance between individual liability and collective solidarity with a view to improve the financial protection of all parties and provide incentives for prevention. Due to the limitation of data, estimated results are of a preliminary nature and thus require further validation with more reliable data. However, the methodology and the process of the determination of contribution rates explained in this report can serve as a guide for the next review.

As a prerequisite for a successful implementation of the measures, the following conditions must be ensured.

First, the employment injury insurance system should be transformed into a "no-fault" system which guarantees an adequate level of benefits throughout the contingency of work accident and occupational disease. In Moldova, there is a general agreement for pooling all the employment injury risk through one insurance system.

Second, as stressed many times, improvement in the collection of employment injury data at the industry and enterprise levels should be given priority action. Without proper knowledge of the frequency and severity of work accidents and occupational diseases, it is difficult to design and implement a suitable contribution rating system for Moldova.

International experience shows that the process of implementing an experience rating system is complex and usually requires several years to complete. It cannot be accomplished without strong long-term commitment and continuous efforts of the key stakeholders. Within the framework of the Decent Work Country Programme for Moldova, the ILO stands ready to provide further technical assistance as a follow up to the recommendations made in this report.

Annex A
Actuarial methods of estimating the average contribution rate

This annex presents the actuarial methods of estimating the average contribution rate based on the benefit structure of the Moldovan employment injury insurance system. After the description of basic principles for the determination of contribution rates, it provides mathematical formulae for actuarial estimation of the average cost for each type of benefit. A more detailed account is found in the ILO/ISSA textbook on actuarial practice in social security.[14]

A.1 Basic formula for contribution rates

The basic formula for the calculation of the contribution rate reviewed in year t is given by:

$$Contibution\ rate\ (t) = \frac{Expected\ benefit\ cost\ (t) + Expected\ administrative\ expenditure\ (t)}{Expected\ insurable\ earnings\ (t)}$$

The expected insurable earnings can be expressed as follows:

$$Expected\ insurable\ earnings\ (t) = Number\ of\ insured\ (t) \times Average\ salary\ (t) \times Density\ (t)$$

The average salary in year t is estimated by:

$$Average\ salary\ (t) = Average\ salary\ (t–n) \times (1+w)^n$$

where $t–n$ is the most recent year for which data on the average salary is available and w is the annual increase rate of the national average salary.

Except for the medical care and rehabilitation services, the expected cost is estimated for each type of benefit in the Moldovan employment injury insurance system with the following formula:

$$Expected\ benefit\ cost\ (t, i) = Number\ of\ beneficiaries\ (t, i) \times Average\ cost\ (t, i)$$

where i indicates the type of benefit.

14 Plamondon, P. et al. 2002. *Actuarial practice in social security*, Quantitative methods in social protection (Geneva, ILO). See in particular, Part III and Technical Brief IV.

The number of beneficiaries is estimated by applying incidence rates of the corresponding benefit type to the number of insured workers. The incidence rates are estimated from past experience. Their level is related to the incidence of the relevant benefits by industry, and furthermore, by sex, age and salary level of injured workers.

The remainder of this annex presents the formulae for actuarial estimation of the average cost for each benefit in a given year. In the formulae of the following sections, the year t and the type of benefit i will be omitted.

A.2 Temporary incapacity benefits

Temporary incapacity benefits are paid for a maximum of six months in Moldova. Therefore, some part of benefits paid in a given year is related to injuries that occurred in the previous year. For simplicity, the benefits paid in a year are estimated based on the injuries that occur in the same year. This is justified because of the benefits design and the observed short duration of benefits. Since the temporary incapacity benefit is equal to 100 percent of the salary, its average cost is estimated as follows:

$$Average\ cost = Average\ daily\ salary \times Average\ duration\ of\ disability$$

The estimated average duration of disability is determined by using the most recent experience. The number of beneficiaries is estimated by applying the incidence rates of temporary incapacity to the number of the insured persons:

$$Number\ of\ beneficiaries = Number\ of\ insured\ persons \times Incidence\ rate$$

The above formulae can be refined to take into consideration the further disaggregation by industry, salary level, sex and age.

A.3 Permanent disability pensions

For a permanently disabled worker of disability degree j, sex s and age x, the average cost of permanent disability pensions is estimated as follows:

$$Average\ cost\ (j, s, x) = d(j) \times Average\ salary\ (s, x) \times Annuity\ (j, s, x) \qquad (1)$$

where $d(j)$: the replacement rate for disability degree j ($j = 1, 2, 3$); specifically $d(1) = d(2) = 0.667$, and $d(3) = 0.667 \times$ (average loss of work capacity);

Average salary (s, x): average salary of pensioners; and

Annuity (j, s, x): the present value of a pension of one monetary unit (1 Moldovan lei).

It should be noted that the pension in the above formula includes both general disability pensions and complementary work-related disability pensions.

For the calculation of the present value of a pension, assumptions on future mortality, recovery from disability, benefit indexation and interest rates should be made.

The estimated cost of permanent disability pensions is obtained by summation of the benefit costs for all types of beneficiaries:

$$Estimated\ benefit\ cost = \sum_{j,\,s,\,x} N\,(j,\,s,\,x) \times Average\ cost\,(j,\,s,\,x) \qquad (2)$$

where $N\,(j,\,s,\,x)$ is the number of newly awarded permanent disability pensions of disability degree j, sex s and age x (estimated by applying the permanent disability incidence rates to the number of insured persons).

A.4 Survivors' pensions and lump-sum benefits

The estimation of the average cost of survivors' pensions follows a similar procedure as for permanent disability pensions. In addition, the average cost of survivors' lump sum benefits should be estimated. For simplicity, a standard profile of a representative beneficiary of these benefits has been assumed.

For a deceased of sex s and age x, the average costs of pensions and lump-sum benefits is estimated as follows:

$$Average\ cost\,(s,\,x) = Average\ salary\,(s,\,x) \times Average\ profile\,(s,\,x)$$

In view of the pension formula and benefit formula, the average profile is expressed by:

$$\begin{aligned} Average\ profile\,(s,\,x) = {} & [0.5 \times P(s,\,x) \times Annuity^{s}\,(s,\,f\,(x)) + 0.25 \times Q(s,\,x) \times \\ & Annuity^{c}\,(s,\,g\,(x))] + [3 \times P(s,\,x) + \{2 + 3 \times Q(s,\,x)\}] \end{aligned} \qquad (3)^{15}$$

where $P(s,\,x)$: probability for a deceased worker with sex s and age x to have a spouse eligible for a pension;

$Annuity^{s}\,(s,\,f(x))$: the present value of one monetary unit of a life pension to a spouse of a deceased worker (calculated as the degree I disability pension); the age of the spouse $f(x)$ is defined as a function of the age of the deceased;

$Q(s,\,x)$: average number of children of a deceased worker with sex s and age x eligible for survivors' pensions (with a maximum of 3); and

15 The estimation of lump-sum benefits of orphans (the last term of equation (3)) uses a linear approximation of the actual benefit formula.

$Annuity^{c}(s, g(x))$: the present value of one monetary unit of a pension to children of a deceased worker (calculated as the degree I disability pension); the age of the youngest child $g(x)$ is defined as a function of the age of the deceased.

The estimated cost of survivors' benefits is obtained by summation of the benefit costs for all types of beneficiaries:

$$Estimated\ benefit\ cost = \sum_{s,\,x} D(s,\,x) \times Average\ cost\ (s,\,x) \qquad (4)$$

where $D(s,\,x)$ is the number of deceased workers due to work-related causes of sex s and age x (estimated by applying the mortality rates due to work accidents and occupational diseases to the number of insured persons).

Annex B
Illustration of the process for estimating the average contribution rate

This annex provides an illustration of the process of determination of the average contribution rate based on the currently available data in Moldova. The scope of liabilities is summarized in Table 3.1.

The main data limitation and its effects on the actuarial estimation are summarized as follows:

- Most of the data refer to total numbers but further sex and age disaggregated data were not available. This particularly affects the estimation of long-term benefits for which the age of occurrence of permanent disability (or death) is a critical parameter. Furthermore, no data on the distribution of salaries or benefits were available.
- The available data exhibit some discrepancies. First, for the same data, different values are reported by different sources. Second, some observed data are significantly lower than international experience. Specifically, the low incidence rates and the short duration of temporary incapacity and the low density of insurable earnings to the average salary suggest the practise of under-reporting of work accidents and under-declaration of insurable earnings in Moldova. Without further investigation of these problems, it was not possible to construct reasonable actuarial assumptions from these incomplete data.

Despite these caveats, this annex discusses the data situation and presents the process to estimate the key assumptions for the determination of the average contribution rate applicable for 2014 based on the experience of the period 2010–2012.

B.1 Data and assumptions

Number of insured workers and insurable earnings

Table B.1 presents the number of insured persons registered with the National Social Insurance House (CNAS) for the period 2009–2012. Due probably to the global crisis, the number of insured persons shows a decreasing trend. It has been assumed that the number of insured persons remains at the 2012 level at 830,000 for 2014.

Table B.1
Number of insured persons of the national social insurance system in Moldova, 2009–2012

Year	2009	2010	2011	2012
Employees	802,321	831,424	806,786	803,875
Self-employed	30,921	28,520	29,603	26,317
Voluntary insured	3,024	2,687	2,091	1,604
Total	836,266	862,631	838,480	831,796

Source: National Social Insurance House.

Data on insurable earnings are not directly available, but they can be estimated from the financial data regarding contribution income. In Table B.2, the insurable earnings are estimated by dividing the contribution income from the CNAS annual reports by the average contribution rate of 28.75 percent taking into consideration the proportion of agriculture workers in the insured population, and the average insurable earnings is calculated from the total insurable earnings and the number of insured persons.

Table B.2
Estimation of the density of insurable earnings, 2009–2011

Year	CNAS contributions	Estimated insurable earnings (million MDL)	Estimated average insurable earnings (monthly, MDL) A	National average salary (monthly, MDL) B	Estimated density A/B
2009	5,598.3	19,472.4	1,940.4	2,747.6	71%
2010	5,985.3	20,818.3	2,011.1	2,971.7	68%
2011	6,562.6	22,826.4	2,268.6	3,042.0	75%

Source: Social security contributions extracted from Raportul privind executarea bugetului asigurărilor sociale de stat în anul 2009, 2010 and 2011. National Bureau of Statistics. ILO estimation.

By assuming that the national average salary will grow at the average rate of increase for the period 2009–2011, the average national average salary for 2014 has been estimated at 3,500 MDL per month.

The density is estimated as a percentage of the estimated average insurable earnings with respect to the national average wage from the National Bureau of Statistics (NBS). The estimated density appears to be low as compared with international experience. This suggests the possible underdeclaration of insurable earnings. Based on these data, the density has been assumed at 70 percent for the purpose of estimation.

Temporary incapacity benefits

Table B.3 presents the incidence rates in 2004–2010 observed in Moldova. As can be seen from Table B.4, the observed incidence rates in Moldova are significantly lower than those observed in most countries. This suggests significant under-reporting of work accidents in Moldova.

Table B.3
Number of work injuries per 100 workers in Moldova, 2004–2010

2004	2005	2006	2007	2008	2009	2010
0.088	0.088	0.087	0.078	0.071	0.097	0.096

Source: Anuarul Statistical Republicii Moldova 2011, Table 3.3.5.

Table B.4
Number of work injuries per 100 workers in selected countries, 2010

Moldova	Canada	France	Germany	Portugal	Thailand (2009)	Trinidad and Tobago
0.10	1.76	3.60	2.58	3.63	0.53	0.48

Source: Data extracted from annual reports published by institutions.

In order to correct for under-reporting, it has been assumed that the incidence rate under the base scenario is three times the observed incidence rate in Moldova for 2008–2010 and that the incidence rate under the alternative scenario is six times the observed incidence rate in Moldova for 2008–2010.

Table B.5 presents the estimation of the average duration of temporary incapacity benefits. Discrepancies between CNAS, NBS and the Labour Inspectorate should be identified and corrected. In line with the ILO recommendation, the employment injury insurance is assumed to cover from the 4th day of absence. By taking into account these factors, the duration of temporary incapacity benefits has been assumed to be 32 days for the purpose of rate setting.

Table B.6 presents the average duration of temporary incapacity benefits in Canada, France and Portugal. It should be noted that the French data is not on the same basis as those of Canada and Portugal.

Table B.5
Estimation of the duration of temporary incapacity benefits in Moldova, 2008–2012

Year	CNAS			NBS*			Labour Inspectorate*		
	Number of injured	Total days**	Average number of days**	Number of injured***	Total days**	Average number of days**	Number of injured	Total days**	Average number of days**
2008	832	20,832	25.0	540	19,000	35.2	…	…	…
2009	669	17,107	25.6	711	16,000	22.5	…	…	…
2010	894	16,559	18.5	569*	13,800*	24.3	530	13,827	26.1
2011	595	17,482	29.4	452	15,843	35.1	425	15,843	37.3
2012	505	14,477	28.7	…	…	…	…	…	…

Notes: * This set of data considers employers with 20 employees and more.
** The number of days includes the initial 20 days paid by employers.
*** The number of injured of NBS data include fatal cases.

Table B.6
Average duration of temporary incapacity benefits in selected countries, 2010 (in days)

Canada	France	Portugal
79	56	41

Source: Canada: https://aoc.awcbc.org/KsmReporting/ReportDataConfig.
France: http://www.risquesprofessionnels.ameli.fr/statistiques-et-analyse/sinistralite-atmp.html
Portugal: Gabinete de Estratégias e Planeamento, Estatisticas en sintese, Acidentes de Trabalho 2010 ILO estimation.

These countries exhibit longer duration of benefits than Moldova. It should be noted that Canada and France have no limit of duration and Portugal pays up to one year, while Moldova pays up to 180 days.

Table B.7 presents estimates of the average daily temporary incapacity benefit based on CNAS data. There are differences between the average monthly salaries estimated from this table and the ones presented in Table B.2. Although it is not unusual to observe that the average salary of injured workers is different from the national average salary, this should be analyzed in more detail.

Table B.7
Data on temporary incapacity benefits in Moldova, 2008–2012

Year	Number of injured	Total days	Amount of benefits (thousand MDL)	Average benefit (daily, MDL)	Estimated average salary* (monthly, MDL)
2008	832	20,832	1,681	80.7	2,421
2009	669	17,107	1,471	86.0	2,580
2010	894	16,559	1,490	90.0	2,700
2011	595	17,482	1,725	98.7	2,960
2012	505	14,477	1,678	115.9	3,476

Source: CNAS.
Note: * Average amount per day x 30.

Permanent disability pensions

The cost estimation of permanent disability benefits requires the establishment of assumptions regarding the incidence rates and the average benefits by degree of disability. For the determination of the average benefits, information on the salaries and the distribution of injured workers by sex and age is necessary. Also, as the present value of pensions needs to be calculated, assumptions regarding mortality rates and economic variables such as inflation and interest rates must also be established.

Table B.8
Data on permanent disability benefits in Moldova, 2007–2010

Year	Degree I		Degree II		Degree III		Total	
	Number	Amount of benefits (Monthly, MDL)	Number	Amount of benefits (Monthly, MDL)	Number	Amount of benefits (Monthly, MDL)	Number	Amount of benefits (Monthly, MDL)
2007	17	10,200	100	82,100	96	20,900	213	113,200
2008	16	10,800	118	120,000	94	26,400	228	157,200
2009	15	11,400	128	143,600	104	41,000	247	196,000
2010	17	21,900	148	160,100	103	43,500	268	225,500

Source: Ministry of Labour, Social Protection and Family Republic of Moldova, Annual social report 2010, Table 3.13, p.60.

Table B.8 presents data on permanent disability pensions by degree of disability. The quality of the data regarding permanent disability pensions is very important as the number of claims is small but the financial impact of each claim is generally significant. Under-reporting of total

permanent disability cases in Moldova is probably not an issue as it is much more difficult to hide severe accidents.

The incidence rates of permanent disability are generally low, especially for degree I and degree II. It is observed that the incidence of degree II and degree III shows an increasing trend while the incidence of degree I remains stable.

For the purpose of contribution estimation, the incidence rates of permanent disability pensions are estimated as a proportion of the temporary incapacity claims. The proportion is assumed at 3.62 percent for degree I and degree II combined (total loss of work capacity) and at 1.26 percent for degree III (partial loss of work capacity). In the alternative scenario additional margins in the incidence rates of permanent disability pensions have been assumed.

With respect to the calculation of present values, mortality rates corresponding to the life expectancies in Moldova have been adjusted to take into account shorter life expectancy. In addition, a real discount rate of 4 percent has been assumed.

Since the sex and age distribution of permanent disability pensions is unavailable, the following estimation formula (1′) has been used which simplify the formula (1) in section A.3.

$$Average\ cost\ (j) = d(j) \times Average\ salary \times Annuity\ (\bar{x}) \qquad (1')$$

where

$d(1) = d(2) = 0.667$, and $d(3) = 0.667 \times$ (average loss of work capacity);

$Annuity\ (\bar{x})$ denotes the present value of a pension starting at the average age $\bar{x}$.

Specifically, the average age of the pensioners at the occurrence of invalidity has been assumed at 40 years, and the resulting present value is estimated to be 216 for one currency unit of the monthly benefits. The average loss of work capacity for disability degree III has been assumed to be 35 percent (i.e., $d(3) = 0.233$).

The benefit cost is estimated by:

$$Estimated\ benefit\ cost = \sum_j \bar{N}(j) \times Average\ cost\ (j) \qquad (2')$$

where $\bar{N}(j)$ is the number of newly awarded permanent disability pensions of disability degree j.

Survivors' benefits

The cost estimation of survivors' benefits requires the establishment of assumptions regarding the incidence rates of fatal cases and their average benefits. Table B.9 presents data regarding the incidence of fatal cases in Moldova.

Table B.9
Data on fatal cases due to work accidents in Moldova, 2006–2011

	2006	2007	2008	2009	2010	2011
Number	31	40	44	30	39	27
Incidence per 1,000 workers	0.050	0.071	0.053	0.050	0.066	...

Source: Compilation by Labour Inspectorate (number) and Anuarul Statistical Republicii Moldova 2011, Table 3.3.5. (incidence per 1,000 workers).

Table B.10 presents statistical data regarding the incidence of fatal cases in Moldova and selected countries. In contrast to temporary incapacity, Moldova exhibits a higher incidence of fatal cases than other countries.

Table B.10
Data on fatal cases due to work accidents in Moldova, 2006–2011

Moldova	Canada (2011)	France (2011)	Germany	Portugal	Thailand (2009)	Trinidad and Tobago
0.066	0.024	0.030	0.014	0.050	0.075	0.014

Source: Moldova: Labour Inspectorate. Other countries: data extracted from annual reports published by institutions.

The experience appears fairly stable. Similar to permanent disability, the potential effect of under-reporting appears to be low.

Partial information regarding the survivors' pensions by type and number of survivors is available in CNAS's database, but no data regarding sex and age profiles. Therefore, the estimation formula (3) in section A.4 has been replaced by the following simplified formula.

$$Average\ profile = [0.5 \times \bar{P} \times Annuity^{s}(\bar{y}) + 0.25 \times \bar{Q} \times Annuity^{c}(\bar{z})] + [3\bar{P} + (2 + 3\bar{Q})] \quad (3')$$

where

$\bar{P}$ is the probability of having a spouse;
$\bar{Q}$ is the average number of children;
$Annuity^{s}(\bar{y})$: the present value of a pension for the spouse starting at the average age $(\bar{y})$;
$Annuity^{c}(\bar{z})$: the present value of a pension for the children starting at the average age $(\bar{z})$.

Specifically, the probability of having a spouse is assumed to be 80 percent; the average age of the spouse has been assumed at 40 years; and, the resulting present value is estimated to be 240 for one currency unit of the monthly benefits. Regarding orphans, the average number of children is assumed to be 1.8; the average age of the youngest children has been assumed at 9 years; and, the resulting present value is estimated to be 108 for one currency unit of the

monthly benefits. These assumptions will result in the average survivors' lump sum equal to 9.8 months' average salary.

With respect to the calculation of present values of spouses' pensions, mortality rates corresponding to the life expectancies in Moldova have been assumed. The termination rates for orphans have been set at 0 until 18 years of age and 0.5 from 19 years until 23 years of age. A real discount rate of 4 percent has been assumed.

The benefit cost is estimated by:

$$Estimated\ benefit\ cost = \bar{D} \times Average\ salary \times Average\ profile \qquad (4')$$

where $\bar{D}$ is the number of deceased workers due to work-related causes.

Medical care and rehabilitation

No data is available on medical care and rehabilitation benefits paid by CNAS for injured workers. As in the ILO recommendation, the employment injury insurance system should cover these costs in the future.

In view of international experience, it has been assumed that the cost of medical care and rehabilitation benefits is equal to 80 percent of the costs of temporary incapacity benefits. It should be noted that this percentage has been between 65 percent and 80 percent in Canada in the last decade, but it can be as high as 500 percent in certain countries.

Administrative expenses

Administrative expenses are usually expressed as a percentage of benefit costs. The CNAS annual reports do not specify the administrative expenses regarding employment injury benefits.

For the purpose of the contribution estimation, it has been assumed that the administrative expenses are equal to 15 percent of the total benefit costs.

Liabilities of the current pensions

The liabilities of the existing beneficiaries of disability and survivors' pensions are to be financed separately. They have been estimated as a product of (i) the number of pensioners, (ii) the average pension, and (iii) the average present value. The average age of the current beneficiaries of disability pensions has been assumed 45 years and the resulting present value is estimated to be 199 for one currency unit of a monthly benefit. Due to the lack of data, the estimation of liabilities of the current survivors' pensions has not been made. However, the amount is expected to be insignificant. The estimated amount of the liabilities is 80 million MDL. The contribution rate necessary for financing these long-term liabilities over a 25-year amortization period is estimated at 0.013 percent.

B.2 Estimation of the average contribution rate

The following table provides an illustration of the calculation of the average contribution rate by type of benefit according to the base data, assumptions and simplified methods explained in the previous section.

		Units	Base assumption	Alternative assumption
A. Insurable earnings				
(1)	Number of insured		830,000	830,000
(2)	Average monthly salary	MDL	3,500	3,500
(3)	Density		0.70	0.70
(4)	Expected insurable earnings (1) x (2) x (3) x 12	million MDL	24,402	24,402
B. Temporary incapacity benefits				
(5)	Incidence rate		0.00264	0.00528
(6)	Average monthly salary	MDL	3,500	3,500
(7)	Average number of days paid		32	32
(8)	Expected cost (1) x (5) x (6) / 30 x (7)	million MDL	8.2	16.4
(9)	Cost as a % of the insurable earnings (8) / (4) x 100		0.034	0.067
C. Permanent total disability benefits (Degree I and II)				
(10)	Incidence rate		0.000032	0.000048
(11)	Average monthly salary	MDL	3,500	3,500
(12)	Average present value per monthly unit of life pension		216.0	216.0
(13)	Expected cost (1) x (10) x (11) x (12) x 0.667	million MDL	13.4	20.1
(14)	Cost as a % of the insurable earnings (13) / (4) x 100		0.055	0.082

		Units	Base assumption	Alternative assumption
D. Permanent partial disability benefits (Degree III)				
(15)	Incidence rate		0.000011	0.000017
(16)	Average monthly salary	MDL	3,500	3,500
(17)	Average present value per monthly unit of life pension		216.0	216.0
(18)	Average degree of disability		0.50	0.63
(19)	Expected cost (1) x (15) x (16) x (17) x 0.667 x (18)	million MDL	2.30	4.31
(20)	Cost as a % of the insurable earnings (19) / (4) x 100		0.009	0.018
E. Fatal cases (pensions)				
(21)	Incidence rate		0.000056	0.000056
(22)	Average monthly salary of the deceased	MDL	3,500	3,500
(23)	Probability of having a spouse		0.80	0.80
(24)	Average present value per monthly unit of life pension to the spouse		240.0	240.0
(25)	Average number of children per deceased		1.8	1.8
(26)	Average present value per monthly unit of life pension to orphans		108.0	108.0
(27)	Expected cost (1) x (21) x (22) x 0.667 x [(0.5 x (23) x (24) + (0.25 x (25) x (26))]	million MDL	15.9	15.9
(28)	Cost as a % of the insurable earnings (27) / (4) x 100		0.065	0.065
F. Fatal cases (lump sum)				
(29)	Average number of monthly benefits to survivors		9.8	9.8
(30)	Expected cost (1) x (21) x (22) x (29)	million MDL	1.6	1.6
(31)	Cost as a % of the insurable earnings (30) / (4) x 100		0.007	0.007
G. Medical care and rehabilitation services				
(32)	Multiple of temporary incapacity benefits cost		0.80	0.80
(33)	Cost as a % of the insurable earnings (9) x (32) x 100		0.027	0.054

		Units	Base assumption	Alternative assumption
H. Total cost of benefits				
(34)	Cost as a % of the insurable earnings (9) + (14) + (20) + (28) + (31) + (33)		0.196	0.292
I. Administrative expenses				
(35)	Multiple of benefit cost		0.15	0.15
(36)	Cost as a % of the insurable earnings (34) x (35)		0.029	0.044
J. Amortization of current pensioners' liabilities over 25 years (as a % of the insurable earnings)				
(37)			0.013	0.013
K. Total contribution rate (as a % of the insurable earnings)				
(38)	(34) + (36) + (37)		0.238	0.349

Annex C
Examples of the experience rating system

C.1 Japan

In Japan, the contribution rate of the Workers' Accident Compensation Insurance is set by industry. As of 2013, the contribution rate varies from 0.25 percent to 8.9 percent in 55 types of business undertaken by the employer. The contribution rate consists of the rate in respect of work-related benefits and the uniform rate in respect of commuting accidents, welfare schemes and administrative expenses (the uniform rate is currently 0.06 percent). The contribution rates are reviewed every three years based on the performance of the preceding three-year period.

To provide employers with incentives for accident prevention, an experience-based system (called the merit premium system) is adopted. Under this system, the contribution rate of an individual establishment can be adjusted upwards/downwards within the range of 40 percent (the maximum adjustment range is 35 percent for the forestry sector, and 30 percent for construction projects). The adjustment is applied only to the contribution rate in respect of work-related benefits. The merit system is applied to establishments with more than 100 workers, establishments with 20 to 99 workers meeting certain statistical credibility conditions,[16] and construction projects whose value is more than 120 million Japanese yen (about one million euro).

Specifically, for each establishment, the ratio of total benefit payments to contributions over the most recent three years (called the "balance ratio") is calculated.

$$\textit{Balance ratio}\ (t) = \frac{\textit{Sum of the benefit payments of the three preceding years}}{\textit{Sum of the contributions of the three preceding years}}$$

If the balance ratio is less than 0.75, then the contribution rate (set by industry) is gradually reduced by up to 40 percent. On the contrary, if this ratio is more than 0.85, then the contribution rate is increased by up to 40 percent. The adjusted contribution rate is applied for the next fiscal year (e.g., if the period of balance ratio is 2010–2012, then the adjusted premium is applied for 2014). Moreover, small and medium-sized enterprises which take certain occupational safety and health measures can apply for the special merit system, which can adjust the contribution rate within the range of 45 percent.

16 The condition requires that the number of employees should be more than or equal to 0.4 divided by the corresponding industrial contribution rate in respect of work-related benefits.

In the 2011 fiscal year, 77,038 out of 2,013,458 establishments (excluding fixed-term or non-recurrent projects) were subject to the merit system. The coverage of the merit system is 3.8 percent in terms of number of establishments and around 60 percent in terms of contribution amount. Of these, 63,460 establishments (82.4 percent) had their premium reduced, 11,968 (15.5 percent) had their premium rates increased, and 1,610 (2.1 percent) had their premium unchanged. In both cases where the contribution rates changed, about half attained the maximum adjustment rate of 40 percent.

C.2 Quebec

In Quebec, the contribution rates for the financing of the provisions in the Act respecting Industrial Accidents and Occupational Diseases and the Act respecting Occupational Health and Safety are set by industry. Contribution rates are determined annually. In 2013, the contribution rates are set for 184 industrial units from 0.56 percent to 19.43 percent, with the average of 2.08 percent. The contribution rate is the sum of the "uniform rate" which is common for all industries (0.43 percent) and the "risk-based rate" which varies by industry.

To provide employers with incentives for preventing work accidents, facilitating rehabilitation, and promoting prompt and lasting return to work, two experience rating systems are in use. The personalized rate system applies to enterprises with annual contributions between 7,500 Canadian dollars (CAD) (around 7,200 USD) and 425,000 CAD (around 410,000 USD), and the retrospective system applies to enterprises with annual contributions over 425,000 CAD. Participation is automatic when thresholds are met. About one third of employers corresponding to 80 percent of contributions are subject to some form of experience rating.

Under the personalized rate system, each enterprise has its personalized risk-based rate obtained by applying a "risk index" to the risk-based rate of the industrial unit(s) in which the enterprise is classified. The risk index is determined by the following formula:

$$Risk\ index = (experience\ index) \times (degree\ of\ personalization) + (1 - degree\ of\ personalization).$$

The experience index is determined by comparing the individual enterprise's employment injury costs over the four preceding years to those of all enterprises in the same unit. The employment injury cost for each claim is calculated as the sum of the benefits multiplied by a factor considering its expected future costs, subject to coinsurance factors and limits. The degree of personalization is a statistical credibility factor that varies inversely with the expected costs of the enterprise. The resulting risk index is limited to a maximum of 3. The total contribution rate of an individual enterprise is the sum of the personalized risk-based rate and the uniform rate.

In fact, the actual process is more complex as several adjustments are made at different stages to ensure that the system is financially well balanced. Furthermore, the risk-based rate is divided into two parts, namely the short-term risk and the long-term risk. Their relative weight varies by industry. This allows calculating two risk-indices based on two different

degrees of personalization. The statistical credibility of short-term costs is larger than that of long-term costs.

Under the retrospective system, refunds or surcharges, the latter being subject to a maximum, are made to the enterprise based on the comparison of the costs incurred by the enterprise and the contribution paid (through application of the personalized rate) four years later. For example, an enterprise subject to retrospective rating in 2013 pays its contribution in 2013, which is calculated by using the personalized rate described above. A refund or a surcharge will be determined in 2017, consisting in the difference between the contribution paid in 2013 and the incurred costs of injuries occurred in 2013. Such costs are calculated as of 31 December 2016 taking into consideration the payments made until that date and an estimate of the future payments. Employers have the possibility of selecting a limit per claim for the calculation of injury costs that best meets their insurance needs.

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