



# Socio-economic Dynamics of Social Insurance in Oman: A Model Approach

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## ABSTRACT

The paper examines the socio-economic dynamics and challenges to the social insurance scheme in Oman, during the period 2002-2016, using secondary sources. The study adopts a confirmatory factor analysis (CFA), and develops a model to identify the determinants of social insurance coverage for active insured and elderly beneficiaries. The study finds evidence that social insurance coverage in Oman is low, amounting to 12.1 and 6.6% for the active insured and the elderly beneficiaries respectively. Results also show that the common economic factors that have an influence on social coverage for both groups include per capita GDP, the fixed capital formation and inflation, while globalization has an influence on the active insured only. Omanization is a common, non-economic factor for both groups, in addition to fertility rate for the active insured, and life expectancy for elderly beneficiaries. Economic factors were found to be more important than non-economic factors for social insurance coverage in Oman.

**Keywords:** Social Insurance Determinants, Active Insured, Elderly Beneficiaries, Confirmatory Factor Analysis, Public Authority for Social Insurance, Oman

**JEL Classifications:** C5, H55

## 1. INTRODUCTION

With the wide range of personal health and economic risks in today's modern life, the social insurance industry plays an important role in economic growth and overall health and well-being of nations (Arena, 2008; Cummins et al., 2016, Din et al., 2017; Muye and Hassan, 2016, Sajid et al., 2017). Through its different products, including life insurance, annuities, disability income insurance and long-term care insurance, the social insurance industry functions as a unique provider of personal financial protection, and a contributor to long-term economic growth, by supporting both consumer spending and capital markets (Impavido et al., 2003; Kugler and Ofoghi (2005)

In Gulf Arab countries, where traditional values and institutions coexist with modern values and institutions, the range of social protection includes an even wider range of benefits and beneficiaries, presenting even more challenges to social insurance

schemes (Soper, 2015). Socio-economic changes present both short term and strategic challenges to social insurance schemes by impacting on their viability and sustainability; demographic changes, labour market conditions and demographic transitions have a potential impact on both the supply and demand of the social insurance market.

The history of modern institutions providing social protection in Oman is relatively recent. Social protection gained momentum by the establishment of the Ministry of Social Affairs on 20<sup>th</sup> May 1972 (Al-Mamary, 2015). Efforts have been further strengthened by the establishment of the Public Authority for Social Insurance (PASI) in 1992, as an important step towards raising the level of welfare and social protection of Omani citizens.

The annual report of (PASI) of 2016 indicated that the number of active insured registered in the social insurance system in Oman in 2016 amounted to 214, 558, with an increase of 2.4% compared

to their number of 209,620 in 2015. Most of the insured (63.5%) were working in large-sized enterprises; 26.6% in the small and medium enterprises (SMEs), while 9.9% in the least-sized enterprises (PASI, 2016).

For the economies highly dependent on oil such as the GCC countries, where the risk of losing jobs is anticipated, given the volatile oil prices, a social insurance scheme provides personal financial protection, and economic stability and long-term economic growth. Although social insurance presumably contributes positively to social and economic life in Oman, little research has been conducted to study its interrelationship with the existing socio-economic environment, which usually undergoes changes that impact its structure and processes over time. The aim of this paper is to assess the level of social insurance coverage in Oman, between 2000-2016, and identify its socio-economic dynamics and challenges. The study develops a model that provides a better understanding of the socio-economic dynamics of the social insurance scheme in Oman, which can be used for policy and scenario analysis for PASI in informed decision making.

The paper poses two key research questions: What is the level of social insurance coverage in Oman, and what are its main determinants? The paper also validates the following two hypotheses

H1: Socio-economic environment variables are significantly related to the social insurance parameters.

H2: Social insurance contributes positively to the economic growth and development of Oman.

The body of the paper is structured as follows: section 2 provides the literature review of the social insurance determinants; section 3 present the methodology, section 4 presents the features of social insurance market in Oman; section 5 provides the results of the model of the social insurance coverage determinants and discussion. Section 6 provides the conclusion.

## 2. LITERATURE REVIEW

### 2.1. Theoretical Framework

Social insurance is a basic feature of the welfare state that emerged in the twentieth century to protect workers whose wages were not high enough to support themselves or their families against adverse life events (Cutler and Johnson, 2004). It poses four characteristics: (i) the benefits, the eligibility requirements and other aspects of the program are defined by statute; (ii) explicit provision is made to account for incoming expenses, often to a trust fund; (iii) it is funded by taxes and premiums paid by or on behalf of the participants; and (iv) the program serves defined beneficiaries and participation is either compulsory or heavily subsidized.

There are several theories explaining the emergence and evolution of social insurance. Most notable among these is the negative effects of capitalism theory, which demonstrates that the unstable economic nature associated with a capitalist system calls for social insurance as a needed safety net (Weaver, 1982; Miron and Weil, 1998). Another theory is Wagner's Law, which postulates that social insurance is a luxury benefit; as income increases, people

attempt to minimize their exposure to extreme poverty (Wagner, 1892). The Leviathan theory argues that social insurance is created when governments have excess revenue, most commonly at the end of wars, and opt for social insurance programmes. (Mulligan and Sala, 1999).

The performance of any social security system is evaluated using three criteria: coverage, adequacy and sustainability. Coverage can be legal or effective. Legal coverage ensures that the benefits, eligibility requirements and other aspects of the program are defined by statute. Effective coverage, on the other hand, is measured, for example, by the number of contributors to the social insurance in each entity, or the number of beneficiaries of any pension benefits among all residents over 60 years of age, or the number of beneficiaries of income support, whose income falls below a specified amount. Rofman and Oliveri (2012) distinguished between occupational coverage (ratio of contributors to employed workers) and labour force coverage (ratio of contributors to the economically active beneficiaries), viewing the latter as producing a better estimate of coverage; the main challenges of the social security system being the level of protection and the scope of coverage.

Adequacy refers to the fact that benefits provide enough income to protect those insured from falling into poverty, should they become disabled or retired. One way to ensure adequacy is the indexation of benefits to inflation. In terms of sustainability, a social insurance system is sustainable only when it has the capacity to pay current and future benefits over a long period of time under reasonable assumptions, without shifting substantial burdens to future generations and without having to cut benefits, increase contributions or change qualifying conditions (AMF and WBG, 2017)

### 2.2. Determinants of Social Insurance Coverage

There is a vast amount of literature attempting to identify the main drivers of the social insurance coverage in developed and developing countries. These include socio-economic and demographic dynamics, which pose great challenges to the sustainability of the social insurance schemes.

Most of the studies have focused on the Organization of Economic Cooperation and Development (OECD) and Latin American countries, driven mainly by the ravage's capitalist theory and Wagner's Law respectively. For example, Khan et al. (2004) examined the relationship between macroeconomic conditions and social security schemes, using annual data for the period 1980-1996 for 13 OECD member countries. The study found that a decline in unemployment increased spending on sickness benefits and reduced disability pensions. The impacts of GDP per capita were positive and significant, whereas mortality rate had no effect. Dragos et al. (2017) investigated the nexus between the demand for life insurance and institutional factors in 32 European countries, and concluded that enforceability of contracts, the independence of justice and time efficiency of the judicial process positively influenced the decision of citizens in developing countries to buy life insurance contracts. For transition and emerging markets, the study found a positive relationship between life insurance density, income distribution and level of urbanization.

A similar study was conducted by Cutler and Johnson (2004) in 20 OECD and Latin American countries, to identify the factors influencing the birth of social-insurance systems, particularly national Old-Age Insurance (OAI) and National Health insurance schemes (NH). Times series data for the period 1960-1998, and univariate regression techniques were used in the study. Five types of theories of social insurance were tested the ravages of capitalism, political legitimacy, Wagner's law, demographic heterogeneity and the Leviathan theory. The study found that none of the tested theories fit the data very well. Limited evidence showed that the probability of adopting a system declines with a country's wealth and the ethnic heterogeneity of its beneficiaries. Catholic countries are more likely to create earnings-related OAI systems, while the growth of OAI spending since 1960 has varied considerably across countries, with fast growth in countries emerging from dictatorship and non-English speaking countries.

The study by Martin and Sastre (2017) analyzed the factors influencing social spending in Latin America during the period 1990–2012. Results indicated that the social spending during the period 1990–2000 was driven by structural differences in fiscal burdens and external debt, while during the period 2001–2012 it was driven by conjunctural differences in the fiscal burden, GDP per capita and the growth of trade and capital openness. GDP per capita was shown to have a positive effect on social expenditures in the first period, while trade openness and GDP per capita negatively affected social expenditures in the second period. The political variables show that during the first period, democratic left-wing governments tended to have a long-term positive impact on social expenditure, specifically on education and health. In contrast, during the second period, authoritarian regimes may have taken more drastic decisions in favor of social spending than democratic regimes.

A second group of studies have focused on social insurance in Asian and Middle East countries, influenced by the Leviathan theory of social insurance. For instance, Akhter and Mohammed (2017) examined the determinants of conventional insurance and Takāful demand across 14 Asian and Middle East countries, during the period 2005–2014. The study concluded that income and the financial sector had a significant positive impact on insurance demand across all regions. On the other hand, dependency ratio was found to negatively affect Takāful demand across all regions, while inflation showed a positive impact. Urbanization was found to have a significant, positive impact on both conventional insurance and Takāful demand. Financial sector development positively triggered the insurance and Takāful demand across the ASEAN region, while it triggered conventional insurance demand only in the Middle East region. Education showed a negative impact on Takāful demand across both regions while it had a positive impact on insurance demand in the Middle East.

Mandigma (2016) assessed the impact of selected economic and non-economic factors on the coverage of social insurance in the Philippines from 2000-2013. Two indicators for coverage were used: one for contributors from the economically active population and another for elderly beneficiaries. Results indicated that factors such as economic stability, capital formation, wage growth and

urbanization, economic development and globalization have an influence on insurance coverage for the economically active population. Coverage corresponding to the elderly beneficiaries is also affected by the foregoing economic factors, except for globalization, but inclusive of national administrative capacity, employment and unemployment. For the non-economic drivers of coverage for the elderly beneficiaries, feminist theory, education, informal sectors and poverty incidence are the main determinants.

Yuan and Jiang (2015) analyzed the factors influencing the demand for life insurance and non-life insurance in China, during the period 2000-2012. The main findings of the study indicated that income level development of the insurance market and level of marketization were the common factors. Education level, development of social security pension, child dependency and elderly dependency ratios mainly affected the demand for life insurance, while inflation mainly affected the demand for alternative insurance to life insurance.

The study of Hong (2014) identified and compared the determinants of public social expenditures in Japan, South Korea and Taiwan, with industrialized welfare states in the West. The study adopted a pooled cross-sectional regression analysis for the panel data. Results suggest that political determinants would probably represent the most important field for welfare development in these countries. Aspalter (2006) addressed the developmental and political aspects of welfare states in Japan, South Korea, Taiwan, Hong Kong and Singapore. The study predicted a convergence of social welfare policies based on common structural determinants such as the degree of economic development, urbanization, modernization and the advance of capitalism.

The study by Turner (1998) examined the retirement income system for different economic, demographic and political environments in 166 countries. The study found that the level of economic development, the beneficiaries age structure and political factors affected the retirement income system. Albarwani (2014) showed that Omanization is part of the government's policy, and the more successful Omanization is, the greater will be the social insurance coverage in Oman. Moreover, since it is generally observed that more women than men tend to accept private sector employment, more Omanization of the labor force means a greater percentage of working women will be covered by social insurance.

From the above literature and based on socio-economic demographic characteristics of Oman, Table 1 provides a summary of determinants of social insurance coverage to be incorporated in our model.

### 3. METHODOLOGY

The study adopted a quantitative approach using a model to examine the dynamics and challenges facing viability and sustainability of the social insurance provision in Oman. The data was compiled from secondary sources from the National Center for Statistics and Information (NCSI), and the Public Authority for Social Insurance (PASI), and World Bank tables, covering the period 2002-2016. Two indicators were used to measure coverage from demand and supply. From the supply perspective, it is proxied by the percentage of the

**Table 1: Summary of the determinants of social insurance coverage**

Determinants	Interpretation and expected relationship
Economic development	Proxied by GDP per Capita for. The link is [+] with higher development stage.
Globalization	Proxied by BOP/GDP. The link is [-] as it entails greater income insecurity to societies.
Modernization	Proxied by real GDP growth. The link is [+] with higher degree of modernization
Economic stability	Proxied by consumer price index inflation rate. The link is [-] with higher rates of inflation.
Saving capacity	Proxied by gross fixed capital formation/GDP. The link is [+] with higher saving capacity.
Omanization	Proxied by the proportion of Omanis in the private sector. The link is [+] as it induces more contribution.
Longevity	Proxied by Omani life expectancy at birth (yrs) The link is [+] with more life expectancy.
Other insurance schemes	Proxied by growth in social security benefits clementariites. The link is [-] with more active insureds.
Beneficiaries replacement	Proxied by total Omani fertility rate (Births per women 15-49). The link is [+] with higher fertility rates.
Health status	Proxied by Omani infant mortality rate (per 1000 live births). The link is [-] with higher infant mortality rates.
Human capital	Proxied by education spending/government expenditure. The link is [+] with more education spending.

GDP: Gross domestic product

active insured population (AIP) contributing to the social insurance system. This indicator is calculated by dividing the active insured in PASI with the population in the age group (15-59). From the demand perspective, the coverage is proxied by the percentage of the elderly beneficiaries (ELD) 60 years or above, receiving social insurance benefits. The indicator was calculated by dividing the elderly beneficiaries of social insurance in PASI by the population aged 60 years and above. Determinants variables influencing coverage, have been categorized into economic ( $X_E$ ), and non-economic ( $X_{NE}$ ) factors, the latter include social, political and demographic variables.

The study employed a confirmatory factor analysis (CFA) to test hypotheses about the determinants of social insurance coverage, defined in matrix notation as follows:

$$Y = A F + \varepsilon \tag{1}$$

where Y is  $n \times 1$  vector matrix for social insurance coverage (SIC), A is  $n \times (k + 1)$  matrix for the coefficients, F is  $k \times 1$  matrix for the factors, and  $\varepsilon$  is  $n \times 1$  matrix of errors associated with n observation. The model can be rewritten as

$$\begin{bmatrix} y1 \\ y2 \\ \cdot \\ \cdot \\ \cdot \\ yn \end{bmatrix} = \begin{bmatrix} 1 & a11 & a12 & \dots & a1k \\ 1 & a21 & a22 & \dots & a2k \\ \cdot & \cdot & \cdot & \dots & \cdot \\ \cdot & \cdot & \cdot & \dots & \cdot \\ 1 & \cdot & \cdot & \dots & \cdot \\ 1 & an1 & an2n & \dots & ann \end{bmatrix} \begin{bmatrix} F1 \\ F2 \\ \cdot \\ \cdot \\ Fn \end{bmatrix} + \begin{bmatrix} \varepsilon1 \\ \varepsilon2 \\ \cdot \\ \cdot \\ \varepsilonn \end{bmatrix} \tag{2}$$

The CFA was conducted based on the following assumptions:

- 1) Principal components analysis was used for factor extraction, as suggested by Costello and Osborne, 2005.
- 2) Scree test was used factor retention for its consistency.
- 3) Varimax method was used for factor rotation to obtain uncorrelated factors.
- 4) A minimum loading of 0.30 was used for an item, with at least 3 items for a factor (Tabachnick and Fidell, 2001).
- 5) Multivariate regression model was used to link social insurance coverage with the economic and non-economic factors for the active insured and elderly beneficiaries.
- 6) Four equations for social insurance coverage determinants were developed as follows:

$$SIC_{AIP} = \beta_0 + \sum \beta X_E + \varepsilon$$

$$SIC_{AIP} = \beta_0 + \sum \beta X_{NE} + \varepsilon$$

$$SIC_{ELD} = \beta_0 + \sum \beta X_E + \varepsilon$$

$$SIC_{ELD} = \beta_0 + \sum \beta X_{NE} + \varepsilon$$

where

SIC is SIC for the active insured population (AIP), and elderly beneficiaries (ELD),

X is the independent variables influencing social insurance coverage, including economic factors (E) and non-economic factors,

$\beta_0$  is a constant or intercept,

$\beta$  is the marginal impact of the X variables on social insurance,  $\varepsilon$  is the error term.

## 4. SOCIAL INSURANCE: OMAN CONTEXT

### 4.1. Social Insurance Market in Oman

The social safety network in Oman is composed of both public and private institutions that provide an assortment of services that help protect Omani citizens against a wide range of risks. The government encourages and supports community and private sector initiatives in social protection, yet it plays a major role by directly financing a number of social assistance programs; most notable among which is the social security program administered by the Ministry of social development. This program provides income support to nine social categories considered to be eligible for social assistance by royal decree no. 87/84 as follows: old people (60 years+), widows, divorced women, orphans, disabled persons, deserted wives, unmarried daughters, families of imprisoned persons and the special category<sup>1</sup>.

Pension funds occupy a central place in the efforts of protection against social risks. The institutional structure of pension funds in Oman falls broadly under two major categories: the public sector employees' pension funds, such as (i) Civil Service Employees Pension Fund, (ii) Diwan of Royal Court, (iii) Royal Oman Police,

<sup>1</sup> This is the category of family-less children who are put under the custody of a substitute family.

(iv) Royal Guard of Oman, and (v) Central Bank of Oman and the private sector employees' pension funds, which include (i) Public Authority for Social Insurance (PASI), (ii) Petroleum Development Oman, and (iii) Oman Refineries and Petrochemicals Co.

Together, the public and private funds provide coverage for more than 400,000 Omani employees and through them, for the defined eligible beneficiaries of their families. On average 53% of this coverage, as shown in Table 2, is provided by the private pension funds targeting private sector Omani employees. Even though these figures are acceptable, they should not be a reason for complacency; as Omani workers comprise on average only 11% of the total employment in the private sector (NCSI, 2017). As full Omanization of the labour force is the goal of the national employment policy, a great challenge is presented, which should be seriously considered, taking into account the strategies of funds catering for covering private sector employees.

Further challenges are presented by the demographic characteristics of those insured through the social insurance funds. According to the NCSI report on pension funds in Oman, 75% of the active insured in the Omani pension funds fall in the age group 20-39 years old, while only 8% of them are 50 years or older (NCSI, 2017); this indicates that the pension funds are largely contributed to by a young labour force. This gives the funds ample chance to pursue sustainability enhancing strategies, while at the same time puts them at risk of managerial laxity due to lack of pressure on their resources, presenting a potential threat to sustainability. This threat has been pointed out by some analysts of GCC social insurance schemes, which are also described as being very generous, offering high replacement rate pensions and covering a wider range of beneficiaries (Soper, 2015). The pension replacement rate in Oman is 80%, which is among the highest in the GCC countries and is very high compared to the replacement rates in western developed countries. For example, the average replacement rate in OECD countries is 54% (OECD, 2013). This generosity is also observed in the public sector pensions schemes and is said to be the main reason for the relatively small size of the private sector insurance coverage in the Middle East and North Africa (MENA) region; as the following quotation reveals: "...Several reasons converge to explain the small size of private pensions in MENA. The main constraint is arguably the generosity of the public pension schemes that offer benefits well above international benchmarks and allow for benefit overlaps through permissive early retirement rules." (Demarco, 2010).

#### 4.2. The Public Authority for Social Insurance (PASI)

The Public Authority for Social Insurance (PASI) was established by the Royal Decree No.72/91 in 1992, with a vision to ensure the social protection of Omani nationals and their families, through the

principles of justice and social solidarity. The insurance services provided by PASI cover a large spectrum of insurable risks; old age, disability and death, work injuries and occupational diseases.

To enhance its mission of providing the maximum possible protection for the insured, in a sustainable manner, on November 3, 2013, the PASI announced a series of amendments to the country's pay-as-you-go (PAYG) public pension program. The amendments which came into effect on July 1, 2014, included the following key changes:

- Contribution rates increased from 6.5% of monthly salary to 7% for employees; from 10.5% to 11.5% for employers; and from 4% to 5.5% for the government.
- The accrual factor used for the calculation of old-age pensions increased. As a result, the pensions are calculated based on 3.5% (up from the 2.5%) of the insureds worker's average wage in the last 5 years of employment, multiplied by the number of full years of contributions.
- The minimum old-age pension increased from 150 ROs (US\$390.12) to 202.50 ROs (US\$526.66) a month. In addition, pensions greater than 202.50 ROs would rise by 5%. (The maximum old-age pension remains the same, at 80% of the insured's pensionable salary).

Oman's PAYG program covers all citizens employed in the private sector under a permanent work contract or working in any one of the other GCC countries. Workers are eligible for an old-age pension at age 60 with at least 180 months of paid contributions (men), or age 55 with at least 120 months of paid contributions (women)<sup>2</sup>. An early pension may be paid at ages 45-59 with at least 240 months of contributions for men or 180 months for women.

## 5. RESULTS

### 5.1. Social Insurance Coverage

Table 3 provides the descriptive statistics for the rates of social insurance coverage for both active (AIP), and elderly beneficiaries (ELD) during the period 2002-2016.

Table 3 shows that the minimum coverage rate for the AIP during the period 2002-2016 is 6.5%, and the maximum is 15.3%, with the average amounting to 12%, and standard deviation of 2.97. In contrast, the coverage rate for the elderly beneficiaries ranges between 0.48% and 10.98%, with the average amounting to 6.57%, and standard deviation of 2.92%. These statistics show that the average social insurance coverage in Oman is relatively

2 Extracted from the United States Social Security Administration Publication *International Update*, November 2013.

**Table 2: Number of insured by public and private sector employees pensions funds 2014-2016**

Year	No. insured by public sector pensions funds	No. insured by private sector Pensions funds	Total insured by both sectors	Share of insured by private sector (%)
2014	170,575	203,505	374,080	54
2015	199,964	216,059	416,023	52
2016	197,250	223,063	420,313	53

Source: Based on data in NCSI: Pension Funds 2016

low. The low coverage rate may be attributed to the low proportion of Omani workers in the private sector, averaging 14.3% over the period 2002-2016 (NCSI, 2017). As the Omanization policy becomes more successful, the social insurance coverage by PASI will increase. Moreover, as previously mentioned, since it is observed that more women than men tend to accept private sector employment, increased Omanization of the labour force means a greater percentage of working women will be under the social insurance umbrella (Albarwani, 2014). Studies have also shown that Omani graduates prefer to work in the government sector, as opposed to the private sector, for job security reasons (Benchiba et al., 2016; NCSI, 2015). Relevant to this is the Global Competitive Report 2015, which showed that one of the most problematic areas in doing business in Oman is related to an inadequately educated workforce. It follows, then, that the output of higher educational needs to be strengthened, and the attitude of graduates changed, to increase their willingness to be employed in the private sector. Another reason for the low social insurance coverage is the generosity of the public pension schemes that offer benefits well above international benchmarks and allows for

benefit overlaps through permitted early retirement rules (Demarco, 2010). There is a need for reform of the public insurance schemes to ensure their sustainability.

### 5.2. Confirmatory Factor Analysis

Table 4 shows the confirmatory factor analysis for social insurance components. The Keiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.363 and Bartlett’s test of Sphericity was significant at 0.000; indicating justification for proceeding with factor analysis, although the sample size is relatively small. The inadequacy of the sample is related to the relatively recent introduction of PASI social insurance in 1992.

This analysis led to three factors, accounting for 77.18% of the cumulative variance in the social insurance coverage, showing a good degree of fit. The three factors were extracted based on the criterion of the eigenvalue greater than 1, which is also confirmed by the scree test, as shown in Figure 1.

Table 5 below shows the rotated components of factors of social insurance coverage. The first contains the items 1,7,10, which explains 34.29% of the total variance of social insurance coverage. These items could be labelled as demographic factors influencing social insurance coverage. The second includes the items 2,8,11 and explains 24.15% of the total variance of the social insurance coverage. These items could be labelled economic factors.

**Table 3: Summary statistics for social insurance coverage for AIP and ELD**

Group	Min.	Max.	Mean	SD	CV*
Coverage of (AIP)	6.53	15.33	12.09	2.97	24.5
Coverage of (ELD)	0.48	10.98	6.57	2.92	44.5

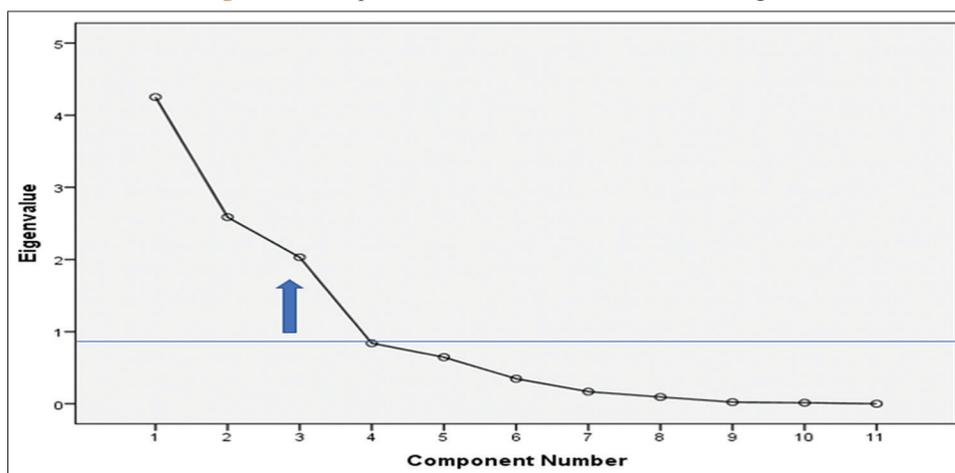
Source: Authors’ calculation

**Table 4: Factor analysis for social insurance components**

Component	Initial eigenvalues			Extraction sums of squared loadings			Communalities
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	
1	3.773	34.296	34.296	3.773	34.296	34.296	0.673
2	2.657	24.151	58.447	2.657	24.151	58.447	0.550
3	2.060	18.728	77.176	2.060	18.728	77.176	0.934
4	0.900	8.184	85.360				0.771
5	0.787	7.155	92.515				0.723
6	0.435	3.950	96.465				0.737
7	0.225	2.048	98.513				0.949
8	0.095	0.861	99.374				0.775
9	0.046	0.423	99.797				0.901
10	0.017	0.153	99.950				0.962
11	0.006	0.050	100.000				0.515

Kaiser-Meyer-Olkin measure of sampling adequacy = 0.318. Bartlett’s test of sphericity approximately Chi-square = 136.34. Extraction method: Principal component analysis

**Figure 1: Scree plot for factors of social insurance coverage**



**Table 5: Rotated components of social insurance coverage matrix**

Variables	Component		
	1	2	3
1. Omani infant mortality rate (per 000 live births)	-0.751	-0.287	-0.164
2. GDP growth rate	0.495	0.520	0.187
3. GDP per capita (in Log form)	0.926	0.107	-0.256
4. Omanization rate in private sector	-0.329	0.791	0.194
5. Growth in social security benefits	0.136	-0.181	-0.820
6. Gross fixed capital formation/GDP	0.576	0.328	0.546
7. Omani life expectancy at birth	0.911	-0.337	
8. CPI Inflation rate	0.435	0.760	
9. Education expenditure/total expenditure	-0.238	-0.347	0.851
10. Total fertility for Omanis (Births/women 15-49)	0.731	-0.653	
11. Balance of Payments/GDP	-0.195	0.539	-0.432

Extraction method: Principal component analysis. Rotation: Varimax with kaiser normalization. GDP: Gross domestic product

The third factor, containing items of 5, 9, with an explanatory power of 18.73 of the total variances could be labelled as a “social factor.” However, a good factor analysis requires at least three items per factor (MacCallum et al., 1999; Raubenheimer, 2004). To combine this factor with any one of the other factors, the option of fixing the number of factors to 2 in SPSS was used, with the result indicated below in Table 6.

Table 6 shows that the first factor contains the items: 2,3,6,8,11, which explains 34.29% of the total variance of social insurance coverage. These items are economic indicators and could be labelled as “economic factors” influencing social insurance coverage. The second factor includes the items 1,4,5,7,9,10, containing social and demographic indicators and could be labelled as “non-economic factors.”

### 5.3. Economic and Non-economic Determinants of Social Insurance Coverage

Table 7 provides the descriptive statistics for the economic and non-economic determinants influencing social insurance coverage for both groups (AIP) and (ELD), during the period 2002-2016.

#### 5.4. Economic Factors

##### 5.4.1. GDP growth

Table 7 shows that Oman’s GDP growth fluctuated greatly during the period 2002-2016, ranging from a minimum of -1.00% in 2011 to a maximum of 13.2% in 2008, with CV amounting to 48.3%; reflecting the volatility of oil prices, the backbone of the Omani economy. These fluctuations will impact employment in both the private and the public sector, as well as the performance of the social insurance schemes.

##### 5.4.2. Inflation rate

Inflation fluctuated greatly in Oman during the period 2002-2016, with a minimum rate of -0.3% in 2002 and a maximum of 12.1% in 2008, corresponding to the global financial crisis. This fluctuation in inflation is reflected by the high CV of 113.4%. With the growing instability in the economy, employment will be uncertain, which will impact the performance of the social insurance.

##### 5.4.3. Per capita GDP

GDP per capita in Oman showed an increasing trend during the period studied, except in the last 2 years due to decline in oil

**Table 6: Rotated components of social insurance coverage matrix**

Variables	Component	
	1	2
1. Omani Infant mortality rate (per 000 live births)	-0.772	-0.225
2. GDP growth rate	0.708	-0.115
3. GDP per capita (in Log form)	0.802	0.474
4. Omanization rate in private sector	0.215	-0.829
5. Growth in social security benefits		0.226
6. Gross fixed capital formation/GDP	0.657	
7. Life expectancy at birth for Omanis	0.523	0.819
8. CPI Inflation rate	0.806	-0.342
9. Education expenditure / total expenditure	-0.399	0.132
10. Total fertility for Omanis (Births/women 15-49)	0.188	0.962
11. Balance of Payments/GDP	0.171	-0.547

Extraction method: Principal component analysis. Rotation: Varimax with kaiser normalization

prices (NCSI, 2017). The minimum per capita of RO 3,037.2 (anti-log of 3.48) was achieved in 2002, and a high of RO 8,131.1 (anti-log of 3.91) was reached in 2012. The average per capital GDP attained during the mentioned period amounted to RO 5,861.8 (anti-log of 3.77).

#### 5.5. Balance of Payments Status

The overall balance of payment as a ratio of GDP fluctuated greatly during the referenced period, as revealed by the high CV of 190.5%, with a negative sign of 13.7% in 2016, a positive sign of 15.6% in 2013 and an average of 3.54% during the whole period.

#### 5.6. Gross Fixed Capital Formation

Table 7 shows that the minimum ratio of gross fixed capital formation was 18.7%, obtained in 2002, the highest was 33.31%, in 2009, and the average percent obtained throughout the whole period was 25.33%.

#### 5.7. Non-economic Factors

##### 5.7.1. Omanization

Table 7 also shows that the minimum Omanization rate during the period 2002-2016 was 10.7%, achieved in 2002 and the highest was 18.8%, achieved in 2005. The average rate during the whole period was 14.3%. The low participation of Omanis in the private sector is attributed to graduates’ preference for working in the government sector rather than the private sector attitude to working in the government sector.

### 5.8. Life Expectancy at Birth

Table 7 shows that during the period 2002-2016 life expectancy in Oman increased, with an average of 75.28 years and a standard deviation of 1.25 years. This trend has been regarded as one of the great challenges to the social insurance system not only in Oman but in all other GCC countries (Soper, 2015).

### 5.9. Education Spending

The share of government spending on education relative to total government expenditure fluctuated greatly during the reference period, with a minimum of 10.3% in 2012 and a maximum of 15.21% in 2016, with the average share being 12.64%.

**Table 7: Descriptive statistics for economic and non-economic determinants of social insurance**

Variables	Min.	Max.	Mean	SD	CV*
Economic factors					
GDP growth rate	-1.00	13.20	4.00	1.93	48.3
Inflation rate	-0.30	12.10	2.76	3.13	113.4
Log Per capita GDP	3.48	3.91	3.77	0.14	3.7
Overall POB/GDP	-13.7	15.60	3.54	6.73	190.5
Capital fixed formation/GDP	18.7	33.31	25.33	3.92	15.5
Non-economic factors					
Omanization	10.7	18.80	14.31	2.83	19.78
Education spending ratio	10.3	15.21	12.64	1.34	10.63
life expectancy at birth	73.0	77.03	75.28	1.25	1.66
Total fertility	3.0	4.00	3.46	0.39	11.34
Omanization	10.7	18.80	14.31	2.83	19.78
Growth in social security benefits	-4.8	38.84	4.44	10.74	241.7
Infant mortality rate for Omani (per 000 live birth)	9.00	16.2	10.16	1.72	16.9

\*CV denotes coefficient of variation

### 5.10. Total Fertility

Table 7 shows that the trend of total fertility for Omani women increased during the reference period, with an average of 3.46 with standard deviation of 0.39; requiring a higher demand for social insurance.

### 5.11. Social Security Benefits

This includes all benefits assigned for social risks covered by the Omani Government Social assistance program, administered by the Ministry of Social Development (GSSS). Both the number of GSSS beneficiaries and benefits increased between 2002-2012 (NCSI, 2017), with variations in the growth of the value of GSSS benefits with the CV amounting to 241.7%, as indicated in Table 7. There could be complementary or substitutability between GSSS and PASI, as PASI covers the same risks. Ideally, in the long term an almost full substitution should be targeted, because the Government budget contributes to the funding of both programs.

### 5.12. Mortality Rate

Table 7 indicates that during the period 2002-2016, the average infant mortality rate for Omanis was 10.16 per 000 live births, with a standard deviation of 1.72. Statistics have shown that infant mortality rates in Oman have declined (NCSI, 2017) due to improvement in health services.

### 5.13. Determinants of Social Insurance Coverage for AIP

Table 8 shows that both economic and non-economic factors have a significant impact on social insurance coverage for AIP, with slope coefficients ( $\beta$ ) of 2.636 and 1.003 for economic and non-economic factors respectively. The R-Squared of 0.903 indicates that 90.3% of the variations in the social insurance coverage for AIP is explained by these two factors. The standardized coefficient (Beta) of 0.888 for economic factors, and 0.333 for non-economic factors reveal that economic factors have more influence on social insurance coverage compared with non-economic factors. This will help policy makers to prioritize intervention when designing social insurance policies.

**Table 8: Model results for social insurance coverage for AIP**

Factors	Unstandardized coefficients		Standardized coefficients		Collinearity statistics	
	B	SE	Beta	T-value	P-value	VIF
Economic factors						
GDP growth	2.636	0.267	0.888	9.868	0.000	1.000
Inflation	-0.019	0.068	-0.022	-0.274	0.790	1.878
Gross cap.form./GDP	-0.397	0.084	-0.419	-4.74	0.001	2.319
GDP per capita	0.217	0.054	0.286	4.018	0.003	1.510
POB/GDP	20.783	1.428	0.986	14.55	0.000	1.364
Intercept	-0.082	0.027	-0.185	-2.99	0.015	1.135
R-squared	-70.28	5.245	-	-13.40	0.000	-
Non-economic factors						
Omanization rate	0.970	1.003	0.338	3.755	0.003	1.000
Education expenditure	0.718	0.145	0.685	4.961	0.001	2.709
Soc. Security benefits growth	-0.247	0.236	-0.112	-1.049	0.319	1.615
Fertility rate	0.000	0.030	-0.002	-0.016	0.988	1.726
Life expectancy	10.609	1.025	1.403	10.351	0.000	2.607
Intercept	-	-	-	-	-	9.956
R-squared	-31.767	6.099	-	-5.208	0.000	-
Intercept						
R-squared	0.930	0.258	-	46.864	0.000	-
R-squared	12.093	0.903	-	-	-	-

Source: Authors' analysis. VIF: Variance inflated factor

**Table 9: Model results for social insurance coverage for ELD**

Factors	Unstandardized coefficients		Standardized coefficients		Collinearity statistics	
	B	SE	Beta	T-value	P-value	VIF
Economic factors	2.337	0.489	0.809	4.779	0.001	1.017
GDP growth	0.178	0.183	0.214	0.972	0.360	1.809
Inflation	-0.496	0.226	-0.531	-2.195	0.059	2.188
Gross.cap.form./GDP	0.433	0.158	0.534	2.741	0.025	1.421
GDP per capita	17.468	4.433	0.720	3.941	0.004	1.252
POB/GDP	-0.047	0.074	-0.111	-0.631	0.546	1.168
Intercept	-70.043	17.329		-4.042	0.004	-
Adj. R-squared	0.786					
Non-economic factors	1.035	0.547	0.320	1.892	0.085	1.017
Omanization rate	0.694	0.185	0.653	3.748	0.005	3.724
Education expenditure	-0.066	0.272	-0.031	-0.243	0.813	2.005
Soc. Security benefits growth	-0.049	0.033	-0.183	-1.454	0.180	1.944
Fertility rate	-	-	-	-	-	20.000
Life expectancy	3.815	0.469	1.465	8.142	0.000	3.968
Intercept	-290.3	36.491	-	-7.957	0.000	-
Adj. R-squared	0.927					
Intercept	6.300	0.479		13.156	0.000	
R-squared		0.69				

Source: Authors' analysis. VIF: Variance inflated factor, GDP: Gross domestic product

While inflation and balance of payments as a per cent of GDP negatively impact social insurance coverage, per capita GDP and fixed capital formation have a positive impact. The GDP growth rate showed no impact. The R-square denotes that 97.0% of the variations in the social insurance coverage of the (AIP) is explained by the inflation, fixed capital formation, per capita GDP, and balance of payment as a per cent of GDP. The high value of the R-square indicates an excellent degree of fit of the model. The variance inflated factor (VIF) shows absence of multicollinearity in the model (VIFs are below 5).

For non-economic factors, Table 8 indicates that Omanization rate and total fertility rate are positively related to the social coverage of the (AIP). These two factors explain 93% of the variations in the social insurance coverage of (AIP). The high VIF value for life expectancy (9.96) justified why this variable has been excluded from the model to avoid the problem of multicollinearity.

#### 5.14. Determinants of Social Insurance Coverage for ELD

Table 9 shows that social insurance coverage for the elderly beneficiaries (ELD) is positively influenced by economic and non-economic factors, with the latter having more importance, as revealed by the standardized coefficient Beta. The R-Squared indicates that 69.0% of the variations in the social insurance coverage for (ELD) is explained by these two factors.

Among the economic factors, social insurance coverage for the elderly beneficiaries (ELD) is positively influenced by the gross fixed capital formation and per capita GDP, and negatively by inflation (being significant at 10%). Further, these three factors explain 78.6% of the variations in the extent of coverage.

For non-economic factors, results indicate that only Omanization and life expectancy at birth are positively correlated with social insurance coverage for the elderly beneficiaries and explain 92.7% of their insurance coverage.

## 6. DISCUSSION

The results of the two models demonstrate that the common economic variables that have an influence on social coverage for both the AIP and ELD are the per capita GDP, the gross fixed capital formation and inflation. These results are consistent with the views of Mandigma (2016), Khan et al. (2004), Martin and Sastre (2017) and Turner (1998), with respect to GDP per capita, and with Yuan and Jiang (2015) for inflation. The results of the two models confirmed the findings of previous literature regarding the positive impact of social insurance on economic development (Arena, 2008, Cummins et al., 2016, Impavido et al., 2003, Kugler and Ofoghi, 2005, Sajid et al., 2017).

Omanization influenced coverage for both the AIP and the elderly insured; while fertility rate and life expectancy at birth were also contributing factors. Spending on education, and growth in social security benefits were not found to have any impact on coverage in both models. The results for spending on education contradict the studies by Mandigma (2016), Yuan and Jiang (2015) and Akhter and Mohammed (2017). This difference in conclusion may be attributed to the different ways of measuring education variables. For example, Mandigma (2016) used adult secondary rate, 25+ years old, as a proxy for the impact of education, while this study used the share of government expenditure on education relative to the total government spending.

The study found that social insurance coverage in Oman is low for both AIP and ELD, amounting to 12.1% and 6.6% respectively. The low coverage and the changes in the socio-economic variables represent a challenge for sustainability of the social insurance scheme in Oman. The slow GDP growth, declining GDP per capita, economic instability due to oil price shocks and financial crises will have an impact on the private sector and also the sustainability of the social insurance. Another challenge from the demographic dynamics is related to the high fertility, low mortality and high life

expectancy coverage of social insurance, in addition to the lack of a qualified workforce. Both dynamics will operate to ascertain that the generous benefits and wide coverage of the social insurance scheme in Oman and other GCC countries are not sustainable and reform is definitely required (Soper, 2015). Reform should include an increase in contribution rates, the raising of retirement age and restrictions on early retirement.

## 7. CONCLUSION

Social insurance in Oman provides personal financial protection, and represents an engine for economic growth, given the risk of oil price volatility. This paper examined the challenges of the socio-economic dynamics to the social insurance scheme in Oman, during the period 2002-2016.

The study highlighted the fact that social insurance coverage in Oman is relatively low, amounting to only 12.1 and 6.6% for the active and the elderly insured respectively. Results show that the common economic factors that influence social coverage for both segments of the beneficiaries include per capita GDP, fixed capital formation and inflation, while globalization has an influence for the active insured only. For non-economic factors, Omanization is common for both groups of insured, in addition to fertility rate for the active insureds, and life expectancy for the elderly insured. Economic factors have more influence on social insurance coverage in Oman than non-economic factors.

Socio-economic changes present both short and long term challenges to the sustainability of social insurance schemes in Oman, and policy makers need to consider these when designing any social policy. A reform to the social insurance scheme in Oman is also a priority, to maintain its viability and sustainability. This would include increasing contribution rates, raising the retirement age and restricting early retirement. Lastly, future work needs to be carried out on the extent to which those insured are satisfied with the services provided. The resulting information could then be used to complement the results of this study.

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