Original Research Article

Analysis of the minimum wage: A mathematical model for the private sector in Saudi Arabia

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This research examines successively the criteria related to the needs of Saudi workers and their families, and then the criteria of Saudi economic nature taken into account when determining minimum wage levels such as poverty line variables, average wage and productivity, the consumer price index, and average employment. According to these criteria’s, the private sector minimum wage in Saudi Arabia should be SR 4,745, which is higher than the current minimum wage and falls within the subsistence level.

Key words: minimum wage, employment, private sector.

INTRODUCTION

Wages generally constitute the vast proportion of the income within a population. According to the International Labor Organization (ILO), more than 1.2 billion workers worldwide don’t have adequate wages to cover their basic needs, which can lead to economic and social problems. Therefore, wages have a direct impact on the economic and social levels of development because wages make up such a large percentage of the national income. At the economic level, wages have a great influence at the macro and micro economic levels because they directly affect economic life and are one of the most important labor market inputs. Moreover, higher wages lead to increased purchasing power and thus increase consumer expenditure, production, competitiveness in the production sectors, which eventually have an impact on the economy.

Wage-fixing criteria based on labor supply and demand, as well as the prevailing legal and economic environment, such as efficient labor laws and trade unions to control wages, the level of competition in the employment market, unemployment, and inflation rates

Furthermore, the method of fixing the minimum wage is not a complex process, though governments aiming to make it at an appropriate level must consider the overall situation subject to a clear and specific policy.

This study aims to determine the social and economic criteria for minimum wage fixing in the Saudi private sector based on a review of the most important theories and international experiences in minimum wages fixing.

The private sector economic growth depends on several factors, the labor costs consider a major part of the Production costs which effect on this growth, failure to fixing minimum wages for this sector will eventually cause the wage/productivity gap.

Hence, there is a need to regulate minimum wages considering its role in economic development, social equity, and the standard of living for low-income working families, and reducing income inequality in society.

This study aims to identify the specific minimum wage fixing criteria in the Saudi private sector to reach an appropriate figure that maximizes benefits for all Parties while minimizing potential negative impacts.

The next section represents the theoretical framework and reviews the various schools that argued the minimum wage theory. This is followed by a comparative study of the different mathematical and quantitative methods in economics. The following section presents the proposed mathematical model that applies to Saudi Arabia according to its specific environment.

The Theoretical Debate about Minimum Wages fixing

Generally, the prices of factors are determined by the interaction of demand and supply, which should also be applicable in determining the wages for labor. However, the
theory of demand and supply is not fully applicable while determining wages for labor. Due to aforementioned peculiarities, economists have advocated different theories for the fixing of wages.

In economic terms, a wage is monetary compensation (or remuneration, personnel expenses, labor) paid by an employer to an employee in exchange for work done. Payment may be calculated as a fixed amount for each task completed (a task wage or piece rate), or at an hourly or daily rate, or based on an easily measured quantity of work done. ILO experts define it as the wage imposed by law in each country, which is binding and enforceable under criminal law and entails punishment. It is the amount paid to the worker for a work done or service rendered within a specified period, and which may not be reduced whether under an individual or collective agreement, and is guaranteed by the law.\(^2\)

Theories that discuss wages stem from the economic freedom principle based on the premise that the market mechanism is the sole determinant of prices and economic activity. These theories do not differentiate between jobs and the labor force, and view the wage as payment for the work that a worker sells to the employer. Economists advocating economic freedom see that the worker sells a certain amount of work, i.e., a number of daily work hours, in exchange for cash or an in-kind wage agreed upon individually or collectively with the employer, and either freely or with intervention by the government or other organizations. Supporters of this theory believe that wage levels are determined by the equivalent value of the minimum necessary living needs of the worker.

In the Keynesian paradigm nominal wages become the nominal anchor for the price level. Minimum wages compress the wage structure and lead to a change in income distribution first of all within wage earners.\(^3\)

The opposing schools eventually broke into two groups: those who support minimum wages and those who do not. The former argue that minimum wages will have positive effects such as increasing the standard of living for the poorest and weakest group in society, encourage individuals to join the workforce, boost incentives for employment compared to other methods that transfer income away from employment (such as food subsidies or welfare payments), stimulate consumption, and increase the circulation of funds through the economy and eliminate low-wages jobs, which will consequently force workers to get better training and seek for higher wage jobs, thus reducing the cost of government social welfare plans by increasing income levels. Setting a minimum wage will have adverse implications, such as lower employment rates, higher inflation and prices, internal migration if there is more than one minimum wage, and impair a country’s competitiveness.

A review of the various minimum wage theories shows a frequent focus on determining the costs of life necessities (poverty line methodology), and on economic criteria such as labor productivity, wage levels, and actual income in the economy. From a free economy perspective, minimum wages cause unemployment because they disturb the labor market and prevent workers with few skills from entering the labor market. On the other hand, while Marxist theory sees that the minimum wage reduces employer’s violations, it implicitly admits that higher minimum wages bring higher unemployment. Neoclassical theory states that minimum wages prevent companies from hiring workers with low productivity that doesn’t cover its cost (wage and social security). While subscribers of the neoclassical school consider minimum wages as neither beneficial nor harmful, post-Keynesian economists consider minimum wages as advantageous to the labor market, though they do impose short term costs to firms.

In this context, Sarra Lemos (2006) investigate the minimum wage effects in Brazil during the period 1982 to 2004 and find evidence of the minimum wage effects for both the formal and informal sectors while there is no evidence of adverse employment effects in other sector. Carneiro and Henley (1998) examine the wage determination in Brazil during the period 1980 to 1990. The author indicates that the reduction in state regulation of collective bargaining has led to the development of a system of wage determination. Therefore, Carneiro and Henley (1998) stress that the real wages appear increasingly inflexible with respect to movements in open unemployment. Neumark and Wascher (2007) review of several studies on the employment effects of minimum wages and indicate that recent research fails to support the traditional view that the minimum wage reduces the employment. Otherwise, Neumark and Wascher (2007) provide some evidence of negative employment effects of minimum wages.

Recently, Dreger et al. (2016) examine the minimum wage fixing criteria in China at the regional level during the period 2004 to 2014. The author uses a set of economic variables such per capita income and consumption, consumer prices, unemployment and industrial structures to investigate the economic criteria of minimum wage fixing. They find that the impact of economic variables declines and the minimum wages do not reflect the regional economic development. Wang and Gunderson (2012) use the difference-in-difference methodology to estimate the employment and wage impacts of the minimum wages in China. They find that the minimum wages in China have an adverse employment effect. In the same way, Wong et al. (2011) examine the employment effect of minimum wages in China during the period 2000 to 2007. The results indicate negative employment effects in minimum wages in Eastern region. Tomada K. (2009) investigates the determinants of the guideline increase and actual increases in regional minimum wages in Japan. The results show that

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the guideline increase is positively affected by the wage growth rate.

The minimum wage is a tool serves specific objectives with Criteria that achievement these objectives.

The Criteria’s represent the priorities in defending against unwanted consequences in terms of determining a higher or lower minimum wage, and provide agreed basic standards for negotiations between the government and social actors, thereby reducing potential conflict.

Fixing a minimum wage aims to achieve a number of objectives:
1. The intended objectives of establishing minimum wages are to prevent the exploitation of workers by employers, to promote a fair wage structure, to provide a minimum acceptable standard of living for low-paid workers and, eventually, to alleviate poverty, especially among working families.
2. Minimum wages are an important tool for social justice by ensuring a more equitable distribution of income using a minimum level that may not be scaled down.
3. Providing a basic ground for the structure of wages and minimizing poverty by providing all or most basic needs.
4. Ensuring that macroeconomic policy will achieve national objectives, such as economic stability and growth, and improve the income distribution.
5. Redistributing income, especially in developing countries to increase low-paid workers’ purchasing power, which will have a positive impact on domestic demand because this group tends to spend a larger proportion of their income on consumer goods and services, which will directly stimulate investment and the economic cycle.

Minimum wage fixing criteria

The minimum wage fixing system is different from country to another, because they often have many rates that can change by region, age, economic activity, or occupation. However, all minimum wage systems adopted on the basis of regular and reliable statistics such as income data, wages, prices, and demographics (sex, occupation, skill levels, etc.).

In designing minimum wages policies, there is two Key principles should be kept in mind. The first is to use the minimum wage in the manner it was intended, namely to provide a decent wage floor. The second principle is to involve social partners- not only in the design and monitoring of the minimum wage system, but also in the decision - making related to setting the level of the minimum wage.

The principle of involve social partners is a key requirement for a successful determination of minimum wages, as workers’ demands for wage increases lead to social and economic conflicts and problems if not settled through negotiation and consultation to identify workers’ basic needs.

The minimum wage must be set in consultation with workers’ representatives, employers, and government representatives within a legal and legislative framework.

Wages can be determined based on labor supply and demand, the legal and economic environment (labor laws and active trade unions, competition, unemployment rates, and inflation in the labor market). However, various international experiences suggest a number of Criteria’s that can provide guidance for fixing the minimum wage, including poverty line, prevailing average wages and their correlation with the cost of living, economic factors such as productivity and the desire to maintain high levels of operation, and economic development requirements.

After the 1928 International Minimum Wage Fixing Machinery Convention, 1928 (No. 26), encouraged countries to implement minimum wages where “no arrangements exist for the effective regulation of wages by collective agreement or otherwise and wages are exceptionally low”.

Following that agreement, the 11th conference in 1928 issued the “the minimum wage fixing mechanism recommendation, 1928” that member states were to implement in accordance with the provisions of the ILO Constitution. The recommendation called for the development of a mechanism to set the minimum wage to ensure equal representation of employers, workers, and "independent persons" on the team with voting power that would ensure effective decisions if the votes are equally divided between employers and workers, and that independent members are selected by agreement or consultation with both groups of representatives. Later, the Minimum Wage Fixing Convention, 1970 (No. 131) called for coverage of “all groups of wage earners whose terms of employment are such that coverage would be appropriate”.

The principle of full consultation with social partners lies at the heart of this Convention.

This Convention Followed by Recommendation No. 30 which calls for measures to be taken to ensure that wages are not paid at less than the minimum rates which have been fixed to safeguard employers against the possibility of unfair competition.

Table (1) shows statistical aspects of minimum wage determination, and the six associated criteria: worker needs, general wage levels, cost of living and changes therein, social security benefits, relative standards of living of other social classes, and economic factors.

However, a deviation between this indicators and minimum wage will have a series unwanted effects on the national economy. A change in productivity will have direct and indirect effects on wages because improved labor productivity is deemed to be an acceptable justification to

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4 Malte Luebker. Determining the level of minimum wages: Criteria. ILO, August 2012
8 Francois Eyraud, Catherine Saget. The fundamentals of minimum wage fixing, International Labour Organization, 2005, p 31
9 Minimum wage policy guide. ILO
<table>
<thead>
<tr>
<th>Criterion</th>
<th>Required statistics and data</th>
<th>Data sources</th>
<th>Availability of data and use restrictions</th>
<th>Importance or use</th>
</tr>
</thead>
</table>
| 1. Meeting basic needs of worker households | Poverty level and basic needs in general and wage earning households in particular | Household income and expenditure surveys, Income tax statistics | • A rich data source, but is conducted every 10 years due to high cost  
• There are reservations on its definition, coverage, and stability  
• Available in all countries | |
| | Average expenditure by low income households on average household goods and services | Household income and expenditure surveys | • Complex and expensive, often only conducted 10-yearly, but a rich data source. | |
| | Related data  
• Family size and structure, with a particular focus on low-income households  
• Current wages paid to unskilled workers  
• Allocation of household income average household income | Labor force statistics, surveys and household surveys and censuses | • Readily available in most countries  
• Criterion Types of statistics  
Objective Possible source Observation | |
| 2. General level of wages in the country | Wage distribution and average wages in general and for unskilled workers separately in different industrial groups, locations, and/or occupations | Business statistics and surveys, household income and expenditure surveys, Labor inspectors’ reports | • Limited coverage of industry groups, Excludes small businesses.  
• Rich source of data, but conducted every 10 years due to high cost  
• Limited coverage | |
| 3. Cost of living and changes therein Consumer Price Index (CPI) | Changes in the prices of goods and services  
• Average household expenditure | CPI index and household income and expenditure surveys | • Available in all countries  
• Rich source of data, but conducted every 10 years due to high cost | • Most widely used economic indicator to measure inflation, CPI is a key indicator of the effectiveness of government economic policy  
• As a means to adjust income payments, the Index directly affects the income of nearly 80 million people  
• As a means to prevent tax changes resulting from inflation Federal income tax rules and those of other countries; CPI to adjust tax brackets and deductions and all monetary values in the tax code  
• Automatically curbs inflation resulting from tax increases, a phenomenon called bracket creep.  
• As a contraction factor of other economic series | |
| 4. Social security benefits | Level and distribution of benefits paid to different types of beneficiaries | Social Security System (SSS) | • Subject to limitations of coverage, definition, stability, etc | |
| 5. Relative living standards of other social groups | Average income and its distribution of each of these different groups  
• Other measures of standard of living (number of rooms, percentage of families living in rented Properties, etc.) | Household Income and Expenditure Survey, Administrative sources, Other household censuses and surveys | • Complex and expensive, often only conducted 10-yearly, but a rich data source  
• Available in most countries Subject to limitations of coverage, definition, stability, etc. | |
Table 1 cont.

<table>
<thead>
<tr>
<th>Economic factors (economic development, productivity, employment and ability to pay)</th>
<th>Business surveys Cost of labor surveys National accounts statistics</th>
<th>Excludes certain industrial groups and small enterprises</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Labor productivity, Real value added, GDP, value of industrial production, foreign trade, illiteracy rates, hospitals, unemployment etc.</td>
<td>Business surveys Cost of labor surveys National accounts statistics</td>
<td>Excludes certain industrial groups and small enterprises</td>
</tr>
</tbody>
</table>


Demand higher pay rates. Employers tend to agree to increase pay and bear the additional cost as long as total production is increasing. However, the extent of convergence or divergence between the rate of wage increases and improvements in productivity depend on the bargaining power of workers and regulators. Thus, there is an expected increase in wages upon increasing labor productivity at a higher rate in countries with more effective trade unions contending with the monopolistic influence of employers. On the other hand, there is an indirect impact from the change in labor demand. Here, we must distinguish between the individual project and the economy as a whole.

The Arab Labor Organization issued a number of conventions on the levels of work that require each member state to set their own systems to set a minimum wage that satisfies workers' basic needs, factoring in differences between the various industries and regions, and called for the formation of joint committees in each region to propose a minimum wage with suitable frequency. The committee consists of labor representatives, employers, and the competent regulatory authorities.

**International experience**

**Europe**

Systems of minimum wage formation in the majority of European countries are based on collective bargaining between the employer and employee representatives, although major differences exist in terms of the predominant level of bargaining and the links between these levels.\(^\text{10}\)

Table (2) shows some of the main characteristics of the minimum wage systems in Euro countries in 2016:

- There were 22 out of 28 European Union member states with official minimum wage set by government.\(^\text{11}\)
- There were seven countries with minimum wage larger than EUR 1,000 - Luxembourg, Ireland, Belgium, Netherlands, Germany, France and United Kingdom.
- Five countries - Slovenia, Spain, Malta, Greece and Portugal averages between EUR 800 and EUR 500.
- All the rest countries and they are ten (located in the East) falls below EUR 500 monthly.

**Asia**

The evolution of minimum wage systems in Asian countries is very different from the developed regions of the world. The Different minimum wage fixing mechanisms are an outcome of the constitutional/legislative intents of respective countries, method of ILO minimum wage implementation adopted, and its evolution over time.\(^\text{12}\)

**India**: India is one of the first developing countries that adopted a minimum wage policy, the Minimum Wages Act (1948) was passed which also followed the pattern of Britain’s minimum wage fixing protocols (i.e., minimum wage fixing by industry).

It has developed one of the worlds most important and sophisticated labor regulation, with more than 1,000 employees in each province.

**Japan**: has separate legislation in place for minimum wages, under which the daily minimum wage is determined by law (there are 47 levels, one for each province), and are reviewed annually based on increases in wages and prices, subject to consultation with the existing local councils.\(^\text{14}\)

The Philippines adopted a fixed minimum wage system

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Table 2. Main characteristics of minimum wage systems in Euro countries 2016

<table>
<thead>
<tr>
<th>Country</th>
<th>Year established</th>
<th>Monthly minimum wages - bi-annual data “2016S2”</th>
<th>Rank</th>
<th>Type of minimum wage system</th>
<th>Wage Determination process formula</th>
<th>Wage Determination process 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luxembourg</td>
<td>1997</td>
<td>1,922.96</td>
<td>1</td>
<td>Clean – cut system</td>
<td>determined by the government, the social partners were consulted</td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td>2000</td>
<td>1,546.35</td>
<td>2</td>
<td>Clean – cut system</td>
<td>Varies, 15-20 months No automatic formula</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>1989</td>
<td>1,531.93</td>
<td>3</td>
<td>Complex System</td>
<td>At least annually Automatic increase in CPI when inflation rate exceeds 2%, and half that so purchasing power equals the wage of manual workers</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>1990</td>
<td>1,537.20</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>1970</td>
<td>1,466.62</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>2015</td>
<td>1,440.00</td>
<td>6</td>
<td>Complex System</td>
<td>No formula</td>
<td>Determination according to a fixed rule – and by the social partners</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1999</td>
<td>1,512.36</td>
<td>7</td>
<td>Clean – cut system</td>
<td>Annual No automatic formula</td>
<td></td>
</tr>
<tr>
<td>Slovenia</td>
<td>1997</td>
<td>790.73</td>
<td>8</td>
<td>Clean – cut system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>1963</td>
<td>764.40</td>
<td>9</td>
<td>Clean – cut system</td>
<td>Annual No automatic formula</td>
<td></td>
</tr>
<tr>
<td>Malta</td>
<td>1990</td>
<td>728.04</td>
<td>10</td>
<td>Complex System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>1994</td>
<td>683.76</td>
<td>11</td>
<td>Complex System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>1990</td>
<td>618.33</td>
<td>12</td>
<td>Clean – cut system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estonia</td>
<td>1991</td>
<td>430.00</td>
<td>13</td>
<td>Clean – cut system</td>
<td>Annual No automatic formula</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>1990</td>
<td>417.02</td>
<td>14</td>
<td>Clean – cut system</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: WSI Minimum Wage Database, Version: January 2016, available at this link Email: www.boeckler.de
Table 2 Cont.

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Minimum Wage</th>
<th>Duration</th>
<th>Wage Adjustment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Croatia</td>
<td>1998</td>
<td>414.45</td>
<td>15</td>
<td>Fixed annual increase rule (unknown)</td>
</tr>
<tr>
<td>Slovakia</td>
<td>1991</td>
<td>405.00</td>
<td>16</td>
<td>Clean - cut system</td>
</tr>
<tr>
<td>Lithuania</td>
<td>1994</td>
<td>380.00</td>
<td>17</td>
<td>Clean - cut system</td>
</tr>
<tr>
<td>Latvia</td>
<td>1992</td>
<td>370.00</td>
<td>18</td>
<td>Clean - cut system</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1991</td>
<td>364.90</td>
<td>19</td>
<td>Clean - cut system</td>
</tr>
<tr>
<td>Hungary</td>
<td>1991</td>
<td>350.09</td>
<td>20</td>
<td>Clean - cut system</td>
</tr>
<tr>
<td>Romania</td>
<td>1999</td>
<td>232.10</td>
<td>21</td>
<td>Clean - cut system</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1990</td>
<td>214.75</td>
<td>22</td>
<td>Clean - cut system</td>
</tr>
</tbody>
</table>

1989 that uses four sets of parameters: needs of workers and their families, the ability of employers to pay the wages, comparative national prevailing wage levels, and the overall national development requirements.

Table (3) summarizes criteria for minimum wage fixing for some countries, which differ by country. Some tend to use certain parameters, such as productivity, cost of living, household needs, and social security benefits, while other countries don’t care for these factors.

Based on a review of international minimum wage fixing experiences, it is possible to infer the key factors to set a successful and efficient wage that maximizes benefits while minimizing the negative potential effects. These are:

1. Using the minimum wage to achieve the desired goal.
2. Engage all stakeholders not only in designing and monitoring the minimum wage system, but also in making decisions related to setting the minimum wage.
3. Engage all stakeholders not only in designing and monitoring the minimum wage system, but also in making decisions related to setting the minimum wage.
4. Engage all stakeholders not only in designing and monitoring the minimum wage system, but also in making decisions related to setting the minimum wage.
5. Using indicators that minimize lost employment opportunities while maintaining international competitiveness, including the general economic conditions compared to GDP, inflation, labor supply and demand, prevailing wage levels, terms of employment, productivity growth, labor cost, operating cost, economic freedom, living standards, and the average prevailing wage.
6. The minimum wage must be above the prevailing level in the professions or sectors dominated by women to reduce the wage gap between the two sexes.
7. Having efficient bodies responsible for setting the minimum wage.
8. Having efficient and reliable mechanisms to implement the minimum wage policy aside from an effective operation and control system with enforceable penalties for non-compliance.
9. Providing appropriate resources to the bodies involved in setting the minimum wage.

**METHODOLOGY**

In this study we examine the minimum wage fixing criteria in Saudi Arabia. The Saudi private sector plays a vital role in the country’s economic, social, and cultural development. The government took many strategic decisions to boost the private sector's ability and competitiveness by assigning government institutions to lead the sector and deal with market conditions to increase national economic growth. Saudi Arabia is seeking to set a minimum wage for workers, which could have direct and indirect impacts on operating costs and the economy. The government could choose among many methods to set the minimum wage depending on job level, sector, and technical parameters.

**Labor market environment in Saudi Arabia**

The Wages Protection Plan in Saudi Arabia monitors
wages paid to all workers in the private sector (Saudis and expatriates) to develop a database containing updated information on wages and determine the extent to which these organizations comply with requirements to pay wages on time and in the agreed upon amount. The implementation included large-scale organizations (3,000 or more employees) during its pilot phase in 2013, during which these organizations could register and upload the wage file into the electronic services portal. Table (4) shows the average salaries and wages of employees in the private sector according to nine main activities: agriculture, forestry, hunting and fishing, mining and extraction of oil, gas and quarrying, manufacturing, electricity, gas and water, construction, wholesale and retail, transportation, storage and communications, finance, insurance, real estate and business services, and the collective social and personal services from 2007 to 2014.

### Suggesting mathematical formula of the Minimum Wage for Private Sector in S.A.

In 2011 the employee minimum wage was adjusted to SR 3,000, and in the same year a 15% cost of living allowance (social allowance) was added to the salaries of all public sector Saudi employees. A study conducted by of King Khalid Charity Foundation in 2014 found that the minimum cost of living for Saudi individuals or households vary by region, and that the minimum average to cover a family’s basic needs is SAR 3,082, while the overall average for all needs of a Saudi family is SAR 8,298. Accordingly, these results will be the basis for the proposed formula to determine the minimum wage, which will be within these limits. Given the characteristics of the Saudi environment, in which job levels vary significantly, a minimum wage could be proposed based on several criteria, including the job level, income, poverty line, consumer price index, productivity level, and the average wage according to the following proposed equation:

\[
MW = \text{Ave} \left( \frac{\text{PLI}}{\text{Ave workers per household}} + \text{Median wage} \right) \times \left( 1 + \frac{P}{100} + \frac{\text{CPI}}{100} - \frac{UE}{100} \right)
\]

(1)

Where:
- \( MW \) = Minimum wage
- \( \text{PLI} \) = Poverty line income
- Median Wage = Average wage
- \( P \) = Productivity level
- CPI = Consumer Price Index (Change) %
- UE = Real Unemployment Rate
- Ave workers per household = 1

The level of employment (UE) is measured based on the worker’s level of education and the job’s average wage. The poverty line income (PLI) is one of the key components of the proposed formula, which has three common methods for measurement: (i) the direct consumption of calories, according to which a family that living on less than 2122 calories/day per person is poor; (ii) consumption of nutritional energy, which considers the poverty to be the level of per capita consumption necessary, and focuses on purely financial rather than nutritional concepts; and (iii) the cost of basic needs method that defines the poverty line by the value of consumption necessary to satisfy minimum

<table>
<thead>
<tr>
<th>Table 3. Criteria for minimum wage fixing, selected countries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country</strong></td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>Europe</td>
</tr>
<tr>
<td>France</td>
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<tr>
<td>Spain</td>
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<tr>
<td>Hungary</td>
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<tr>
<td>Poland</td>
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<tr>
<td>United Kingdom</td>
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<tr>
<td>China</td>
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<tr>
<td>Japan</td>
</tr>
<tr>
<td>India</td>
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<tr>
<td>Malaysia</td>
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<tr>
<td>South America</td>
</tr>
<tr>
<td>Brazil</td>
</tr>
<tr>
<td>Argentina</td>
</tr>
<tr>
<td>Canada</td>
</tr>
</tbody>
</table>

living needs. There are two common uses of the international poverty line. The first is the lower line, which is one dollar/day per capita in low-income countries, and the second is the upper line, which is two dollars/day for daily consumption per capita in low-medium income countries. Both are measured by fixed prices of purchasing power parity established in 1985 or 1993. The sufficiency line, equivalent to the poverty line, of an average Saudi household has been estimated at SAR 8,926.10 per month, composed of the monthly arithmetic averages of ten basic family needs (housing, food, clothing, health care, schooling, infant needs, luxuries, transportation, basic services, and entertainment). According to this method, those living below this line are poor. However, not all workers need all of these things, and they could be excluded from the total value of the sufficiency line components, meaning that this line will be less than the value quoted above. If the Saudi household is estimated to be 5 members, the per capita poverty or sufficiency line in Saudi Arabia will be SAR (8,926.1÷5=1,785.22). The median wage is considered to be the average salaries of employees working in the private sector by the main economic activity for 2012, covering the nine sectors shown in Table (4), which is equal to SAR 4,356. The consumer price index includes a number of statistical criteria to measure standard parameters, though the LASPEURE equation is also commonly used. It divides the prices of the focal year by the prices of the base year, and takes the average of the base year values. The LASPEURE price equation of is as follows:

\[ P = \frac{\sum P_i}{\sum W} \times 100 \]

Where \( P_1 \) is the current price, \( P_0 \) is the price in the base year, and \( W \) represents weights. The basic cost of living for the entire population in all sixteen cities for the base year 1999 is 134.5%. In terms of employment levels (UE) that expresses the rate of change in the monthly employment rates, an increase in UE indicates increased spending and a higher level of the economic performance, and vice versa. Thus, an increase in the benchmark results would imply an increase in employment, reflecting positive economic conditions. The employment level as reported by the Ministry of Labor in Saudi Arabia for 2012 is estimated at 34%. Finally, economists consider productivity (P) as the real source of economic growth, social well-being, and improved standards of living in any country, regardless of its economic activity. Productivity growth rates and an analysis of its fundamentals provide a clearer picture of economic activity and uncovers the strengths and weaknesses of such activity. Countries are struggling to ensure sustainable and increasing productivity growth rates by introducing continuous improvements in terms of technology, management, and human resources. This is how developed countries achieved significant industrial progress while gaining control over the world economy. In a broad sense, productivity is defined as the output divided by input, which was 7.4% in Saudi Arabia in 2011.

Thus, the minimum wage in Saudi Arabia should be:

\[ MW = Ave(1,785.22+4,105)\times(1+34.5%+34%-7.4%) \]

\[ MW = Ave(5,890.22)\times(1+0.345+0.34-0.074) \]

\[ MW = 2,945\times1.611=4,744.57 \]

Thus, the proposed minimum wage in Saudi Arabia is SAR 4,744.57, with 1999 as the base year, which is certainly higher than employees' minimum salary, but is within sufficiency line. Once this rate is agreed, its formula can be

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20 Sami aldamegh, Poverty line in Saudi Arabia, King Khalid Charity Foundation 2014
21 Sami aldamegh, Poverty line in Saudi Arabia, King Khalid Charity Foundation 2014.
22 Ministry of Labor, 2012

23 Saudi Arabia Monetary Agency (SAMA), 51, pp. 383. 2015.
24 http://www.arabictrader.com/portal/ar/kb/details/
26 Banque Saudi Fransi,16,2, 2011, p 11

Table 4. Average private sector salaries and wages in Saudi Arabia, 2007 -2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>3,722</td>
<td>2,260</td>
<td>3,624</td>
</tr>
<tr>
<td>2008</td>
<td>3,679</td>
<td>2,419</td>
<td>3,601</td>
</tr>
<tr>
<td>2009</td>
<td>3,204</td>
<td>2,255</td>
<td>3,137</td>
</tr>
<tr>
<td>2010</td>
<td>3,562</td>
<td>2,448</td>
<td>3,476</td>
</tr>
<tr>
<td>2011</td>
<td>5,686</td>
<td>2,824</td>
<td>5,349</td>
</tr>
<tr>
<td>2012</td>
<td>5,315</td>
<td>2,613</td>
<td>4,801</td>
</tr>
<tr>
<td>2013</td>
<td>5,355</td>
<td>3,153</td>
<td>4,748</td>
</tr>
<tr>
<td>2014</td>
<td>5,557</td>
<td>3,374</td>
<td>4,973</td>
</tr>
</tbody>
</table>

Source: Ministry of Labor, the statistics report for several years
Discovered and analyzed for the following years according to the following formula:

\[ MW_y = \alpha CPI + \beta GDP + \gamma AWG + \delta \text{ others} \] (3)

Where:
- \( MW_y \) : Proposed minimum wage for the year \( y \)
- \( MW_{y-1} \) : Minimum wage for the year \( (y-1) \)
- CPI : Inflation of consumer prices
- GDP : Gross domestic product
- AWG : Average wage growth
- Others : Productivity as other factors

**DISCUSSION AND CONCLUSION**

Formulating an effective minimum wage policy poses a major challenge that requires an alignment of and balance between economic and social goals that may seem inconsistent. For example, raising the minimum wage may seem desirable from a social equity perspective, though it may be difficult for the private sector to sustain it. Therefore, the proposed method must be based on accurate data and information that will likely lead to the most reasonable rate that will create reliability, especially for the private sector, which depends on the balance of fair pay and financial returns for efficiency. The rate proposed herein considers all available variables. After reviewing all private sector activities, it is also within the limits of the sufficiency line established by recent studies in this filed. However, this paper proposes the following considerations to determine an appropriate and accurate scale to set the minimum wage:

1. The minimum wage should be linked to labor productivity so it does not unduly increase labor costs and lead to other consequent economic effects, such as undermining competitiveness and increased inflation, while achieving the main objective of the minimum wage legislation, which is protecting and providing and adequate standard of living for low-income workers.
2. The minimum wage issue may not be considered in isolation. Setting the minimum wage should consider other economic variables in a comprehensive manner, since the minimum wage affects and is affected by other variables, such as prices, inflation, productivity, distribution of and return on capital, and unemployment, all of which are interrelated and correlated.
3. An institutional framework should be established to ensure that compliance with the agreed minimum wage, along with rigorous measures to implement the policy.
4. The information used to set the wage must be accurate and consider all details of the labor market, including labor composition and qualifications, including the proportions of expatriate and national workers. In addition, inflation, productivity, and other economic indicators must be accurately calculated.

The proposed model has taken into account most of these factors. The model methodically derives a minimum wage that will serve the interests of all stakeholders, based on costs of living by embedding the poverty line into the formula, as well as economic variables such as labor productivity, employment, and base prices in order to incorporate different variables. Upon implementation of the wage protection program to cover small enterprises, it will be easier to arrive at an appropriate minimum wage.

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Euro found.