REPUBLIC OF LEBANON
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Assessing Labor Income Inequality in Lebanon's Private Sector

Findings, Comparative Analysis of Determinants, and Recommendations

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Abstract: *This paper examines labor income distribution in Lebanon using Personal Income Tax declarations by the private sector. Results show that private sector earnings are disproportionately distributed between income groups with the top 2 percent capturing a share of income almost as high as that of the bottom 60 percent. The calculated Gini coefficient places Lebanon at a rank of 129 from 141 countries in terms of income equality. Following a cross-country analysis and a literature review, broad medium term measures to help narrow the gap between income groups are proposed. An adequate regulatory environment to foster formal sector growth, provision and relevance of education, female labor participation, and policies that support employment in disadvantaged rural and urban districts, are recognized as key factors in the promotion of inclusive growth and income convergence. Short of the proposed measures, inequality in Lebanon is at risk of widening further over the long term with the introduction of the petroleum industry into the economy and the potential uneven spillover of its gains.*

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I. Introduction

Income inequality has been a vastly examined theme in view of its economic, social, and political significance. A large number of studies have been devoted to determining and assessing its theoretical methods of measurement[1], estimation within and between countries and regions[2], relationship to growth[3], underlying determinants[4], and social outcomes[5]. In recent years, income inequality gained renewed attention as studies using novel methods of data collection and analysis produced longer spanning and more accurate time series on shares of top income groups[6]. Compiling those results and the work of independent researchers from around the globe, the World Wealth and Income Database (WID) [7] was created in 2011 with the intention of providing free access to the data in order to offer insight on the topic and support further analysis.

With little available data on income distribution in Lebanon, this paper follows through on some of the methodologies used in the WID with the aim of narrowing the knowledge gap on income inequality. It utilizes tax declarations from the Lebanese Ministry of Finance for the fiscal year of 2014 and analyzes income distribution of private sector employees, self-employed individuals, and proprietors. While the employed data does not cover Lebanon's aggregate labor market, it offers a broad and fairly accurate view of income distribution in the private sector, representing an estimated 31 percent of the labor force[8].

Results show that Lebanon suffers from a high level of inequality within both the employee and self-employed segments of the private sector. On an aggregate basis, the top 2 percent income group accounts for a 17 percent share of total income, while the bottom 59 percent accounts for a 22 percent share. Lebanon registers a high Gini coefficient of 50.7 ranking at 129 from 141 countries in terms of equal distribution of income.

The rest of the paper is structured as follows, Section II discusses the methodology of calculation and data constraints; Section III presents the results, Section IV examines possible determinants of income inequality through a cross-country analysis and literature review and Section V concludes with final remarks and recommendations.

[1] Lorenz M.O. (1905), Gini C. (1921), Atkinson A.B. (1970), Cowell F.A. (2000).
[2] Ravallion M. & Chen S. (1999), Fields G.S. (2003).
[3] Aghion, P. Caroli, E., & Garcia-Penalosa, C. (1999), Barro R.J. (2000), Birdsall, N., Ross, D., & Sabot, R. (1995), Kuznets S. (1955).
[4] Chong, A., & Gradstein, M. (2007), Fleisher B., Li H. & Zhao M.Q. (2010), Maxwell N.L. (1990) Reuveny R. & Quan L. (2003).
[5] Wilkinson R. & Pickett K. (2006), Wilkinson R. & Pickett K. (2009).
[6] Piketty T. & Saez E. (2003), Piketty T. (2003), Atkinson A.B (2005).
[7] The World Wealth and Income Database: http://www.wid.world.
[8] Lebanon's labor force is estimated around 1.5 million individuals, including residents and refugees in the formal and informal sectors.

II. Methodology and Data Constraints

1. Methodology

Labor income for the fiscal year of 2014 is assessed using tax declarations from two databases at the Lebanese Ministry of Finance, namely the Income Tax on Wages & Salaries and Income Tax on Profits databases. Income levels are available on a disaggregated basis or in other terms, for every single taxpayer, but could only be obtained for this study in compiled form under six income brackets as per the income tax law (Table 1).

Wage statistics were extracted from the declaration form 'R6'[9] and detail declared wages of private sector employees paid on a monthly, weekly, or daily basis. Those are inclusive of basic salaries, employment benefits (transportation, overtime, and other indemnities), and allowances (health insurance, education, and maternity among others).

Proprietors' income statistics were extracted from declaration form 'F1' and detail profits of self-employed individuals and proprietors. Among others, those include incomes of retailers and wholesalers, basic service providers, technical professionals (engineers), health sector professionals (doctors, dentists, pharmacists, and nurses), and judiciary professionals.

Table 1: Annual income brackets and ratio of higher-end of bracket to minimum wage

Income Brackets (LL million)	Minimum Wage (LL million)	Bracket's Top Margin to Minimum Wage (Ratio)
< 6	8.1	0.7
6-15	8.1	1.8
15-30	8.1	3.7
30-60	8.1	7.4
60-120	8.1	14.7
120 <	8.1	14.7 <

Source: Ministry of Finance, UNDP calculations.

Using the collected data, a Lorenz curve is constructed displaying the cumulative share of total income held by a cumulative proportion *x* of the population, expressed by the function $L(x)$ with individuals ordered by income brackets in an increasing order. The generalized form of the equation is expressed as $L(x) = \frac{\int_0^x f(t)dt}{\int_0^1 f(t)dt}$ whereby the numerator sums incomes of the bottom *x* proportion of the population, and the denominator, incomes of the aggregate labor force, and where *x* takes values between zero and 1.

A Gini coefficient is then computed as G =$1 - 2\int_0^1 L(x)dx$ representing the relative measure of inequality, and ranging between 0 and 100, with zero as perfect equality and 100 as perfect inequality.

[9] Income declaration forms can be found on the Ministry of Finance website: www.finance.gov.lb

2. Data Constraints

i. The study provides a snapshot of income distribution in 2014, and does not offer a time series analysis of income inequalities due to the unavailability of reliable data prior to 2014. This presents a limitation for the analysis of historical changes in income distribution in relation to parallel economic, policy, or structural changes.

ii. With an estimated 50 percent of the Lebanese labor force operating in the informal sector[10], this study excludes a large portion of non-declared private sector employees and self-employed individuals. Undeclared businesses and employees fall to a large extent in lower income brackets, suggesting a possible underestimated level of inequality. According to the International Labour Organization (ILO)[11], an estimated half of Lebanon's informal sector employees earn less than the monthly minimum wage of USD 450. Having said so, there is also indication that wages and incomes are under-declared for all income strata, in part reflected by Lebanon's low Personal Income Tax to GDP ratio, which stood at 0.8 percent of GDP in 2014 compared to 2.3 percent in selected non-oil producing MENA countries and 8.9 percent in OECD countries[12].

iii. Wages of public sector employees are not captured in this study given that the information is currently unavailable on a disaggregated level. The total number of employees working at the central government both full-time and part-time was around 140,000 in 2014, with a total wage bill of USD 3.0 billion or 6.0 percent of GDP[13]. These numbers are non-negligible and would ideally be included in any revised publication.

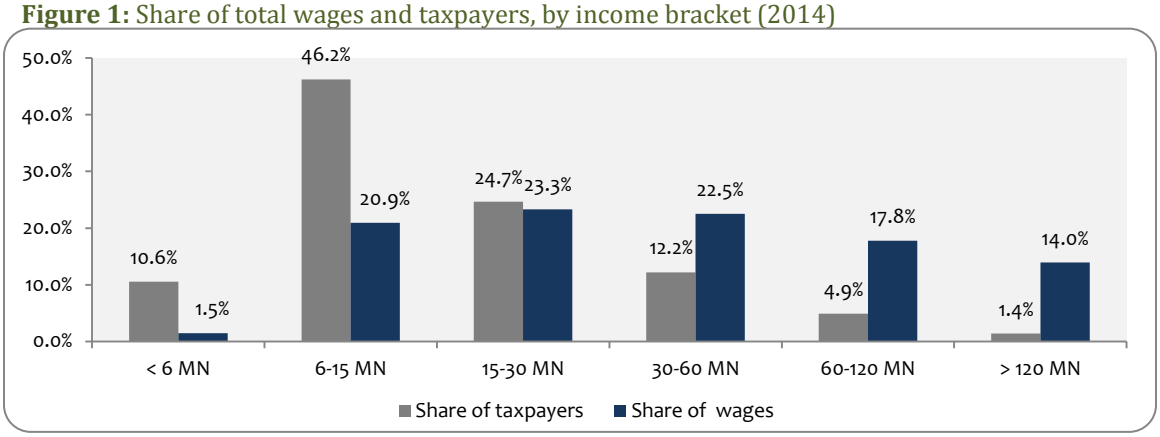
[10] World Bank (2015).
[11] ILO: Ajluni S. & Kawar M. (2015).
[12] Organization of Economic Cooperation and Development (OECD), www.data.oecd.org.
[13] For more information, kindly refer to the 2014 Public Finance Annual report.

III. Results

1. Wage Distribution of Employees

Data from tax declarations of employees captures 369,279 taxpayers representing a cumulative income of USD 5.5 billion (11.1 percent of GDP[14]), and an average yearly income of USD 14,846. The figures show that wages in Lebanon are highly skewed towards lower income brackets. The lowest two brackets, or earners of up to LL 15 million annually (~USD 10,000[15]) account for 56.8 percent of all employees and 22.4 percent of total declared wages. At the other end of the range, the highest two brackets, account for 6.3 percent of employees and take in 31.7 percent of total declared wages.

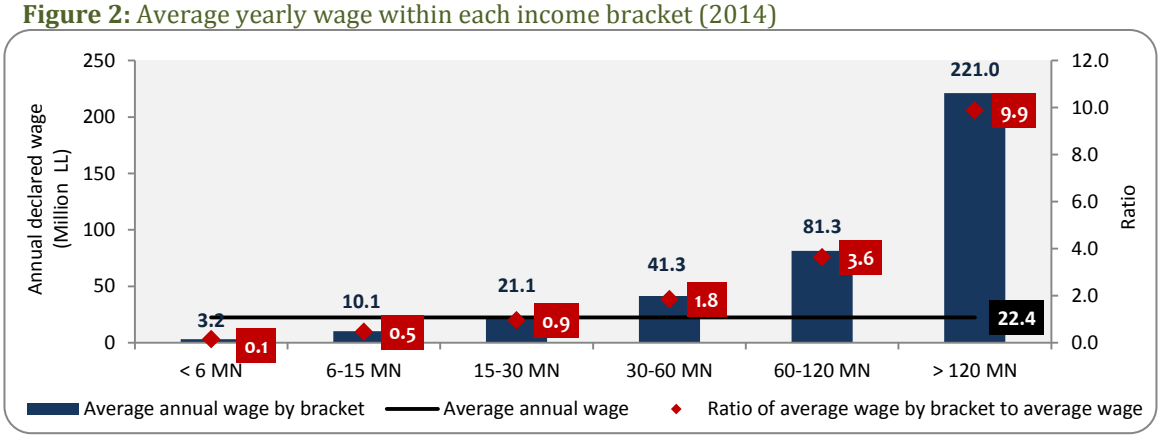
Figure 1: Share of total wages and taxpayers, by income bracket (2014)



Source: Ministry of Finance, UNDP calculations.

Average declared wages within brackets further highlight the disparity in distribution, with annual average wages ranging from LL 3.2 million (~USD 2,000) at the lowest income bracket to LL 221.0 million (~ USD 147,000) at the highest. With an aggregate average wage of LL 22.4 million (USD 14,846), the lowest income bracket earns on average 0.1 times the national average wage, while the highest bracket earns 9.9 times the national average wage.

Figure 2: Average yearly wage within each income bracket (2014)



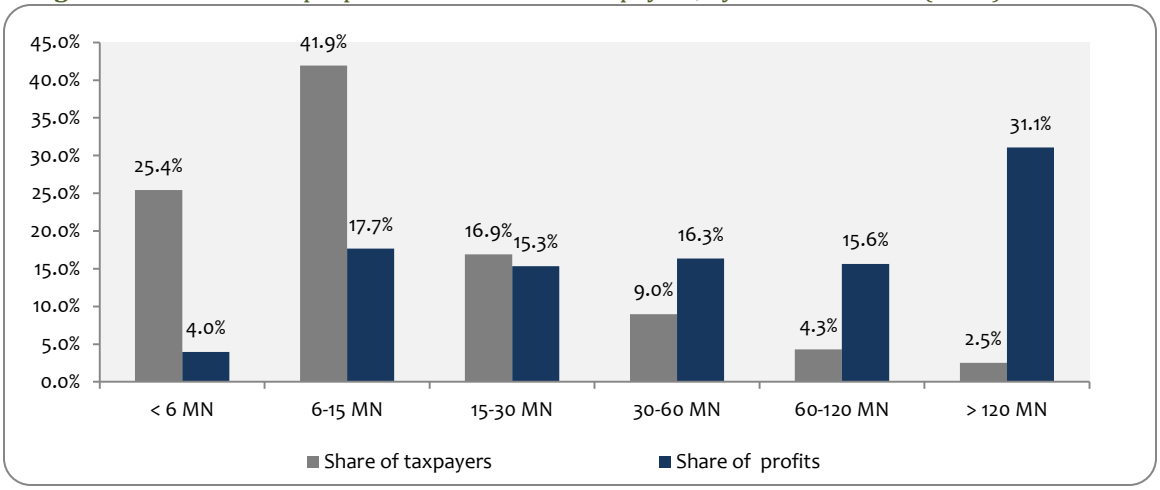
Note: Average within-bracket wages are not ideal for representations of brackets since they could be influenced by a small number of observations at the tails of the distributions. Unfortunately, the use of medians was not possible in this study owing to the bracket-compiled form of the data.
Source: Ministry of Finance, UNDP calculations.

[14] Nominal GDP in 2014 is estimated at USD 49,518 million. This figure, which is adopted throughout the paper, was computed using IMF October 2016 WEO real growth and deflator (based on 2013 CAS GDP figure).
[15] Throughout the paper we assume an exchange rate of LL 1,507.5 per USD.

2. Self-Employed and Proprietors' Income Distribution

Data from tax declarations of business owners captures 88,040 taxpayers representing a cumulative income of USD 1.3 billion (2.7 percent of GDP), and an average yearly income of USD 15,148. Figures depict a highly uneven distribution of income shares whereby the lowest two brackets account for 67.3 percent of all business owners, but only 21.6 percent of total declared income, whereas earners from the highest two brackets, account for 6.8 percent of business owners and take close to half of total declared income.

Figure 3: Share of total proprietors' income and taxpayers, by income bracket (2014)



Source: Ministry of Finance, UNDP calculations.

3. Labor Income Distribution

The full dataset combining employees, self-employed individuals, and proprietors, captures 457,319 individuals, or 31 percent of Lebanon's labor force[16], representing a cumulative income of USD 6.8 billion (13.8 percent of GDP). Average yearly income is calculated at USD 14,904 and compares to a GDP per capita[17] of USD 11,067 in 2014.

The results show that the bottom 59 percent of taxpayers (i.e. individuals with an income less than LL 15 million) earn 22 percent of total income. In contrast, the top 2 percent of taxpayers earn 17 percent of total income. These figures reflect a high level of inequality, as per the calculated pre-tax Gini coefficient of 50.7 placing Lebanon at a rank of 129 from 141 countries in income equality, for which World Bank estimates are available[18], while keeping in mind that the calculated index does not reflect Lebanon's overall inequality, but income inequality across private sector employees, self-employed individuals and proprietors.

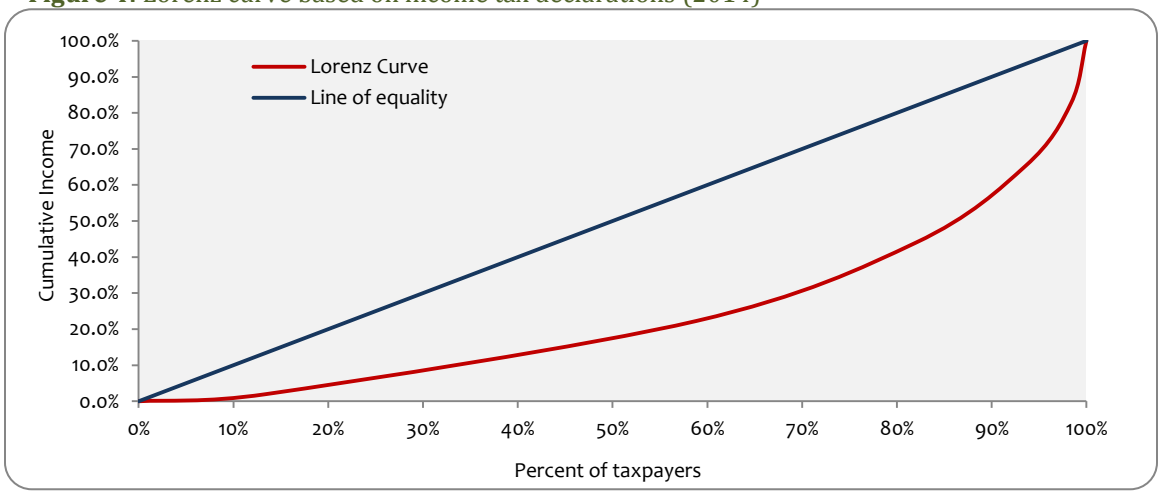
In order to control for some of the possible data irregularities listed in Section II in their effect on the calculation of the Gini coefficient, we undertake a theoretical adjustment whereby we shift taxpayers with declared incomes below LL 6 million to the second lowest income bracket (i.e. LL 6-15 million), and place their wage at the bracket's average. With this theoretical adjustment, the Gini coefficient remains relatively high at 45.3.

[16] Full labor force figures for 2014 include residents and refugees, and are derived from 2009 figures published by Lebanon's Central Administration of Statistics (2011) "The labor market in Lebanon", World Bank population estimates and UNHCR statistics on registered refugees in Lebanon.
[17] International Monetary Fund, World Economic Database October 2016.
[18] Estimates by the World Bank for the Gini coefficients are for the closest available year to 2014.

This adjustment is undertaken given that Lebanon's minimum annual wage is above LL 6 million (LL 8.1 million), and assuming that employees reporting below that figure are under-declaring their income. This however may not necessarily be the case as the data includes part-time wage earners, hourly, and daily contractors that could be earning below the minimum wage on an annual basis.

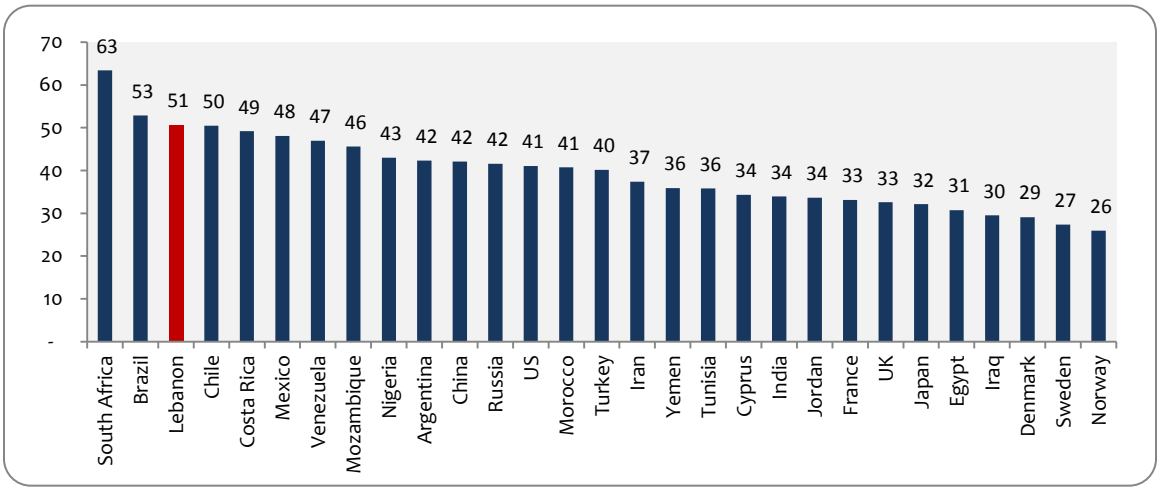
Also worth reiterating that employees in the informal sector fall to a large extent in lower income brackets, of which half earn less than the annual minimum wage according to survey data from the ILO, suggesting that national inequality levels could in fact be higher than measured using formal sector tax declarations.

Figure 4: Lorenz curve based on income tax declarations (2014)



Source: Ministry of Finance, UNDP calculations.

Figure 5: Gini coefficient – Comparison with selected countries

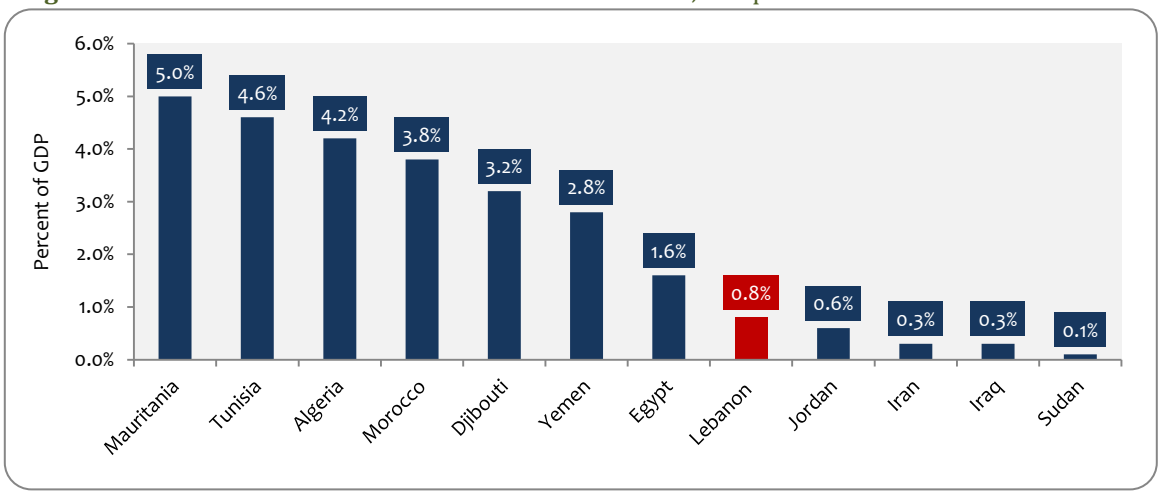


Note: Estimates by the World Bank for the Gini coefficients are for the closest available year to 2014.
Source: World Bank, Lebanese Ministry of Finance, UNDP calculations.

4. After-Tax Income Inequality

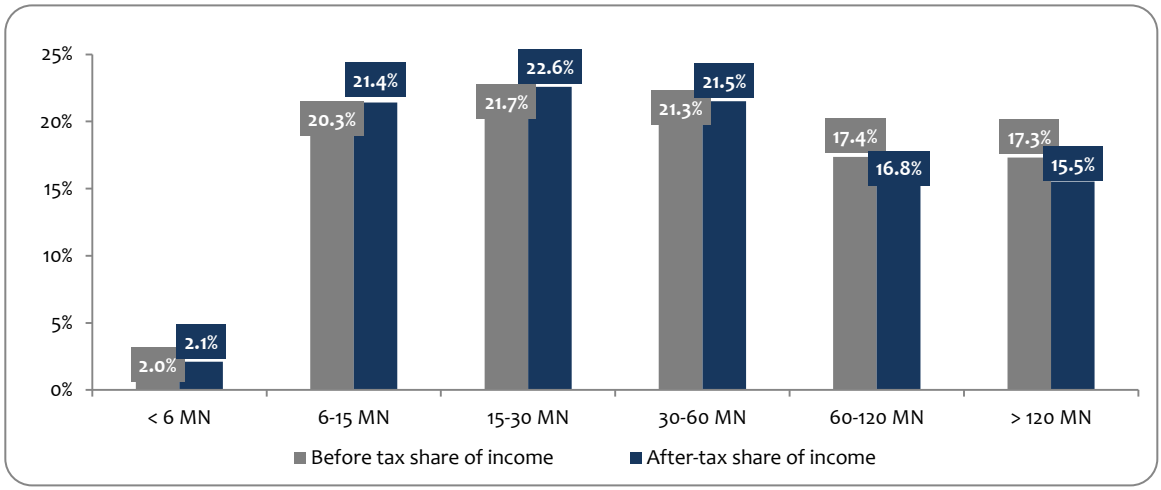
Personal income tax is progressive in nature and slightly contributes to narrowing the income gap. In Lebanon, the average effective tax rate for annual incomes below LL 6 million and between LL 6 million and LL 15 million was close to zero in 2014, and around 15.4 percent for incomes above LL 120 million (Annex: Table 4). However, aggregate personal income tax collections were only 0.8 percent of GDP, or lower than most selected countries in the MENA region. Broad underlying factors behind the low level of income tax to GDP include the size of the informal economy, the level of under-declarations, and policy-defined exemptions. Verifying the extent of the effect of each factor requires a comprehensive tax gap analysis. Calculation of post-tax inequality yields a Gini coefficient of 48.5, representing a small decrease of 2.1 points from the pre-tax Gini, compared to an average decrease of 14 points between pre-tax and after-tax Gini coefficients in OECD countries[19].

Figure 6: Personal Income Tax in selected MENA countries, as a percent of non-oil GDP



Note: Data for the latest available year varies between countries; the figure for Lebanon is for the year of 2014.
Source: International Monetary Fund, Lebanese Ministry of Finance, UNDP calculations.

Figure 7: Shares of before tax and after tax income, by income bracket (2014)



Source: Lebanese Ministry of Finance, UNDP calculations.

[19] Organization for Economic Cooperation and Development (OECD), www.stats.oecd.org.

IV. Analysis of Inequality Determinants and Country Comparisons

With the absence of historical data on Lebanon to permit a time-series analysis of the evolution in income distribution, a number of variables that are considered central in driving income inequality are identified in reference to previous literature and assessed for the case of Lebanon. Using 76 countries including Lebanon (Annex: Table 7) at early and intermediate stages of development and for which data on all identified variables is available, we conduct a cross correlation analysis classifying the countries into two groups according to their GDP per Capita, equal to and above the median of USD 3,670 and below that median. By doing so, we control for the fixed effects shared by countries hereafter referred to as lower income countries and higher income countries.

Table 2: Definitions of indicators used in correlation analysis

Gini	Gini Coefficient.
GDP-pc	GDP per Capita, USD constant 2010 prices.
DB	World Bank Doing Business Ranking - most to least favorable.
SB time	Average Number of days needed to start a business - World Bank DB sub components.
SB cost	Cost needed to start a business as a percentage of income per capita - World Bank DB sub components.
EC	Enforcement of Contracts, measuring time and cost for resolving commercial disputes through first-instance court, and the quality of judicial processes.
Corruption	Corruption Perception Index, 2014 scores, (least to most favorable) - Transparency International[20].
Credit	Getting Credit, World Bank distance to frontier score from 0 to 100 (least to most favorable) - World Bank DB sub components.
Informality	Percent of Firms competing with unregistered firms.
Mnf - % GDP	Manufacturing value added as a percentage of GDP.
HT	High Tech Exports as a percentage of total manufacturing exports.
Rural-pop	Rural population as a percent of total population.
Fem-labor	Female labor force participation as a percent of total female population (15 years and above).
Education	Gross enrollment in secondary education, as a percentage of population of official secondary education age.

Source: International Labour Organization, Transparency International, World Bank, Lebanese Ministry of Finance, UNDP calculations.

[20] The Corruption Perception Index published by Transparency International, utilizes scores and indices on governance, rule of law, competitiveness, country risk and institutional quality

Table 3: Cross correlations of selected indicators

Below the Diagonal: Countries with a GDP per Capita below the calculated median of USD 3,670.

	Gini	GDP-pc	DB	SB time	SB Cost	EC	Corruption	Credit	Informality	Mnf-%GDP	HT	Rural-pop	Fem-Labor	Education
Gini	1	-0.23	0.47	0.51	0.29	0.43	-0.18	-0.15	0.55	-0.35	0.06	-0.24	-0.31	-0.47
GDP-pc	0.00	1	-0.43	-0.16	-0.31	-0.27	0.57	0.03	-0.20	0.23	0.19	-0.28	0.28	0.48
DB	0.18	-0.57	1	0.51	0.66	0.54	-0.42	-0.55	0.47	-0.34	-0.30	-0.10	-0.48	-0.38
SB time	-0.06	0.18	0.17	1	0.19	0.07	-0.18	-0.23	0.26	-0.07	0.00	-0.06	0.05	-0.09
SB Cost	0.41	-0.44	0.54	0.22	1	0.42	-0.32	-0.20	0.47	-0.06	-0.13	-0.03	-0.48	-0.39
EC	0.15	-0.14	0.46	0.24	0.20	1	-0.28	-0.35	0.37	-0.31	-0.14	0.12	-0.32	-0.46
Corruption	-0.18	0.27	-0.17	0.15	-0.13	-0.13	1	0.24	-0.24	0.29	0.22	-0.03	0.23	0.39
Credit	-0.04	0.56	-0.75	0.07	-0.28	-0.20	0.14	1	-0.25	0.06	0.16	0.12	0.29	0.11
Informality	0.34	-0.29	0.47	0.04	0.35	0.36	-0.03	-0.21	1	-0.20	-0.03	-0.37	-0.34	-0.21
Mnf-%GDP	0.08	0.65	-0.34	0.11	-0.16	0.22	0.28	0.38	-0.10	1	0.28	0.10	0.09	0.23
HT	-0.10	0.14	-0.08	0.00	-0.17	0.01	0.08	0.00	-0.08	0.08	1	-0.25	-0.04	0.21
Rural-pop	-0.23	-0.65	0.16	0.06	0.07	0.06	-0.02	-0.28	0.00	-0.37	0.11	1	0.07	-0.09
Fem-Labor	0.15	-0.35	-0.05	-0.14	0.22	-0.28	0.00	-0.14	0.20	-0.33	-0.30	0.17	1	0.37
Education	-0.20	0.76	-0.59	0.16	-0.43	-0.20	0.19	0.53	-0.48	0.45	0.00	-0.58	-0.23	1

Above the Diagonal: Countries with a GDP per Capita above the calculated median of USD 3,670.

$0 \leq \lvert x \rvert < 15$	$15 \leq \lvert x \rvert < 33$	$0.33 \leq \lvert x \rvert < 0.5$	$0.5 \leq \lvert x \rvert$

Note: Figures above the diagonal are correlation coefficients of countries with a GDP per Capita above USD 3,670
Figures below the diagonal are correlation coefficients of countries with a GDP per Capita of USD 3,670 and below.
Source: International Labour Organization, Transparency International, World Bank, Lebanese Ministry of Finance, UNDP calculations.

Higher Standards of Living are Inconsistently Associated with Lower Inequalities

Higher income countries with a GDP per Capita above the median of USD 3,670 in our sample register a marginal correlation coefficient of -0.23 between inequality and GDP per Capita. In countries below that median the relationship is negligible (Table 3).

Numerous studies have empirically examined with varying results the notion that inequality increases at the initial stages of development and decreases after a certain level of income is attained[21]. This trajectory is known as the Kuznets inverted U curve, and is to a large extent explained by the effects of industrialization and rural-urban migration on income inequality[22].

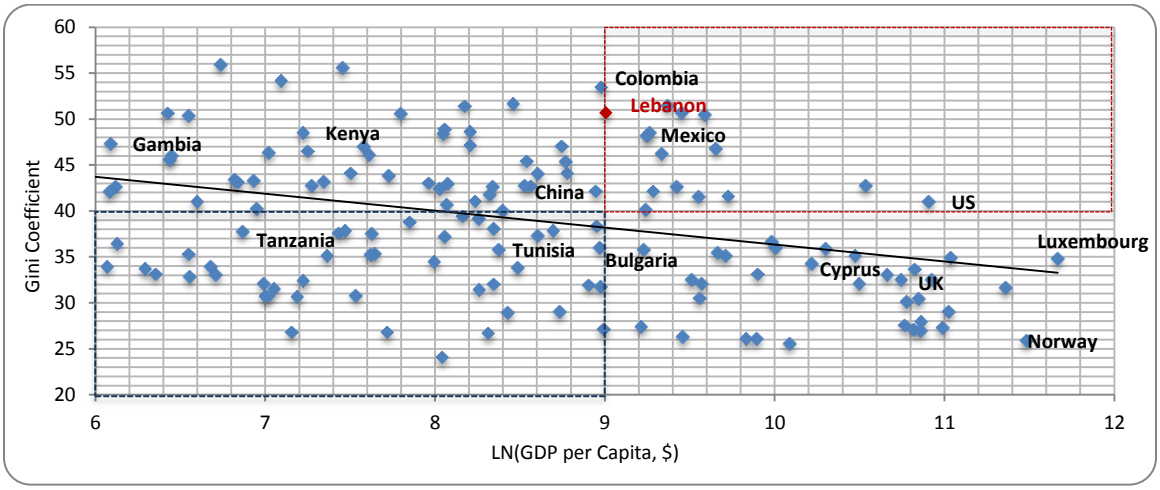
Although cross-sectional analysis does not permit assessment of the presence of a Kuznets curve for each country, plotting Gini coefficients against a measure of development, GDP per capita in this case[23] (Figure 8), we note the clusters of countries at the lower left and the

[21] See Kuznets S. (1955) and (1963).
[22] Anand S. & Kanbur S. (1993), Barro R.J. (2000), Birdsall N., Fields G.S. (2001), Ross D., & Sabot R. (1995).
[23] The Kuznets curve is commonly related to per capita Gross National Income rather than per capita Gross Domestic Product.

lower right quadrants of Figure 8, indicating the precedence of poverty over inequality in low income economies and the high frequency of low inequality in high income economies. While this does not necessarily confirm a causal relationship between growth and inequality, it does reflect to a certain extent the shape of the Kuznets curve for countries at different stages of development, maintaining the possibility of confounding variables that simultaneously influence growth and inequality (i.e. regulatory, economic, demographic).

Lebanon's GDP per Capita was USD 11,067 in 2014, well above the median of selected countries. However, a Gini coefficient of 50.7 places it in our figure together with Central and Southern American countries (Brazil, Chile, Colombia, Ecuador, Mexico, Panama, Uruguay, and Venezuela) and other countries with relatively high GDP per capita and high inequality including Russia and South Africa.

Figure 8: Gini coefficients plotted against GDP per capita



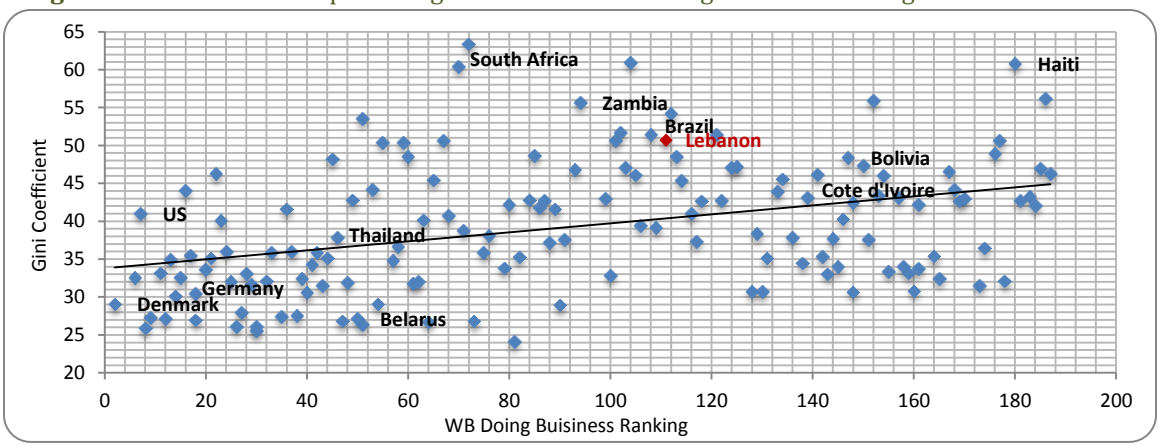
Note: Graph includes additional countries to those used in cross-correlation analysis.
Source: World Bank, Lebanese Ministry of Finance, UNDP calculations.

Low Institutional Quality, Corruption, and Informality Widen the Income Gap

Institutional quality is an essential component in supporting overall living standards and income equality. In higher income countries, we note robust positive correlation coefficients between the Gini on one hand, and 'time needed to start a business' (0.51), overall doing business rankings (0.47), and the score for adequate enforcement of contracts (0.43) on the other, suggesting that more equal opportunities to access and operate in the private sector reduce country inequality levels. The relationship is similarly robust between the Gini and informality (0.55), indicating that high informal employment exacerbates inequality.

The intuition here suggests that a regulatory environment that facilitates market entry for smaller and medium businesses, and one that provides adequate insurance of rights through a well-defined and enforced rule of law, reduces informality and the incidence of monopolies reinforced by preferential policies. This in turn contributes to providing new employment opportunities and improving wage terms. On the other hand, informality drives down wages forcing formal businesses to compete with firms that operate at substantially lower costs by non-conforming to regulatory and minimum wage requirements.

Figure 9: Gini coefficients plotted against World Bank Doing Business rankings

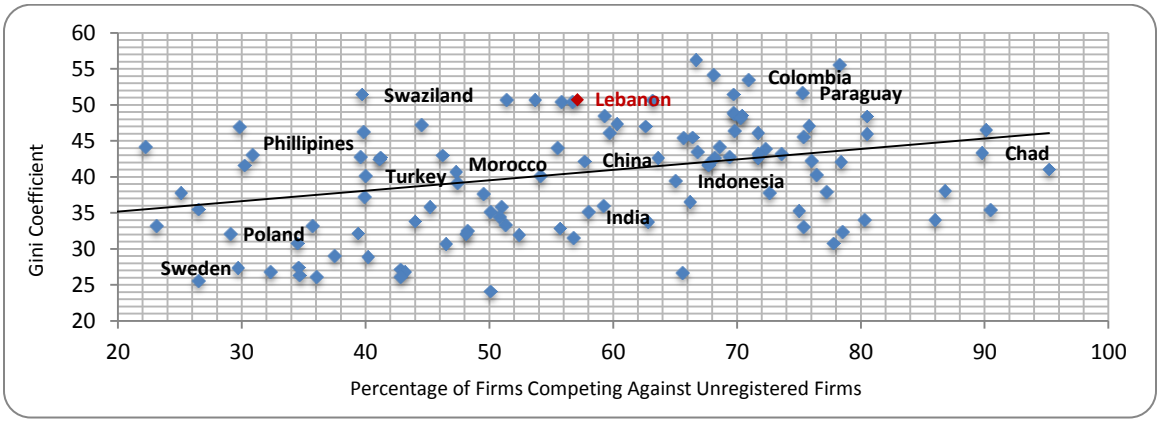


Note: Graph includes additional countries to cross-correlation analysis.
Source: World Bank Doing Business Rankings 2014, Lebanese Ministry of Finance, UNDP calculations.

Literature pinpoints robust two-way relationships between institutional quality and corruption on growth and income inequality[24], supporting the benefit of addressing institutional shortcomings for the promotion of growth and equity. Literature on informality and inequality also finds strong relationships between the size of the informal sector and income distribution[25], and indicates that the size of the informal sector reduces evidence for the negative effect of corruption on income equality[26]. This is supported in our data by the weaker link between the Gini and the corruption perception index in both higher and lower income economies (-0.18). Finally, the link between informality and inequality is reinforced through other channels namely the extent of female employment in the informal sector and its negative effects on gender wage gaps and income distribution[27].

In 2014, Lebanon ranked 111 of 189 countries in the World Bank's ease of doing business[28], whereas informal employment was estimated at a significant 50 percent. In terms of the corruption perception index, Lebanon ranked at 136 of 174 countries.

Figure 10: Gini coefficients plotted against percent of firms competing against unregistered firms



Note: Graph includes additional countries to cross-correlation analysis.
Source: World Bank, Lebanese Ministry of Finance, UNDP calculations.

[24] Chong A. & Calderón C. (2000), Scully G. (1988), Jong-sung Y. & Khagram S. (2016).
[25] Chong A. & Gradstein M. (2007).
[26] Dobson, S., & Ramlogan-Dobson, C. (2010).
[27] Khera, P. (2016).
[28] Lebanon's WB Doing Business Ranking was at 126 in 2017.

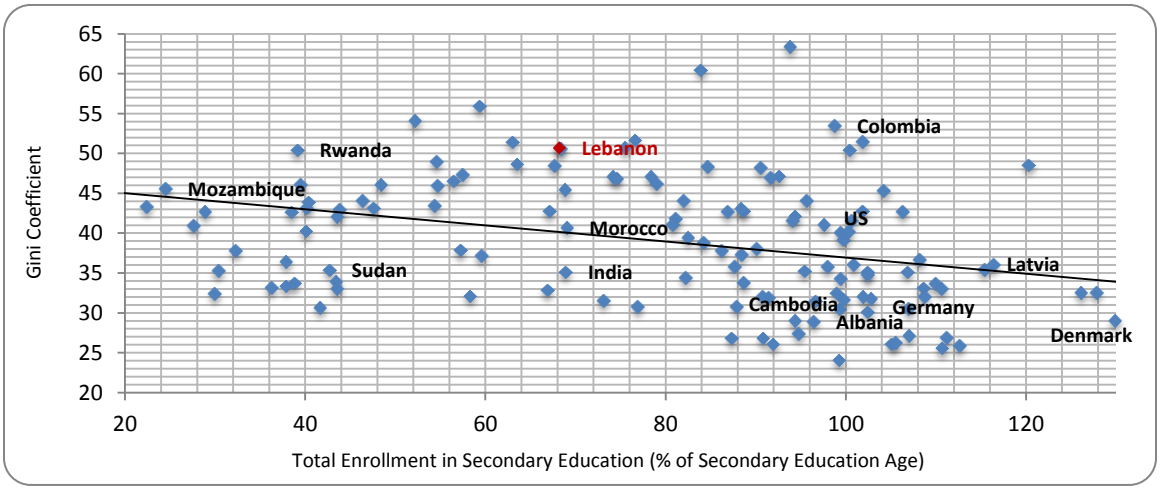
Educational Attainment Benefits Growth and Income Convergence

With the dependence of growth and income on productivity and labor skill, countries with higher skilled labor and educational attainment levels tend to register lower income inequality (Figure 10). The relationship of education with growth and inequality is however is not always as straightforward in terms of causality, owing to mismatches between education supply and labor market needs, inequalities in access and quality of education within countries[29], and the diminishing marginal returns to education at higher levels. Studies that address the long run effect of improving access and quality of education at primary and secondary levels nonetheless empirically support the direct positive relationship with growth and income convergence. This is particularly relevant in improving living standards of lower income groups and narrowing the overall income gap bottom up[30].

Data from Table 3 shows clear links between Education (enrollment at the secondary level) and the Gini coefficient, and Education and GDP per Capita for countries above the median with coefficients of -0.47 and 0.48 respectively. In lower income economies, the relationship between Education and inequality is less significant at -0.2, whereas its link with GDP per Capita is extremely high at 0.76, supporting literature on the positive effect of human capital development on living standards in lower income countries.

In 2014, Lebanon's enrollment ratio in secondary education as a percent of total secondary age population was around 68 percent, compared to an average 75 percent for all countries in our data, and averages of 95 percent and 55 percent in countries above and below the GDP per capita median respectively. Lebanon's EFA Development Index[31] that gauges primary net enrollment ratios, adult literacy rates, gender disparities in education, and survival rate to grade 5 ranked 64 of 113 countries, with lower relative scores on adult literacy and gender disparities in education.

Figure 11: Gini coefficients plotted against Gross Secondary Education Enrollment Ratios



Note: Numbers can exceed 100 percent due to the inclusion of over-aged and under-aged students because of early or late school entrance and grade repetition. Graph includes additional countries to cross-correlation analysis.
Source: World Bank, Lebanese Ministry of Finance, UNDP calculations.

[29] Glomm G. & Ravikumar B. (2003), Rodríguez-Pose A. & Tselios V. (2009).
[30] Abdullah A., Doucouliagos H. & Manning E. (2013), Birdsall N., Ross D. & Sabot R. (1995), Sylwester K. (2002).
[31] Education for All Development Index (EFA development index) is a gauge developed by UNESCO comprising country scores on.

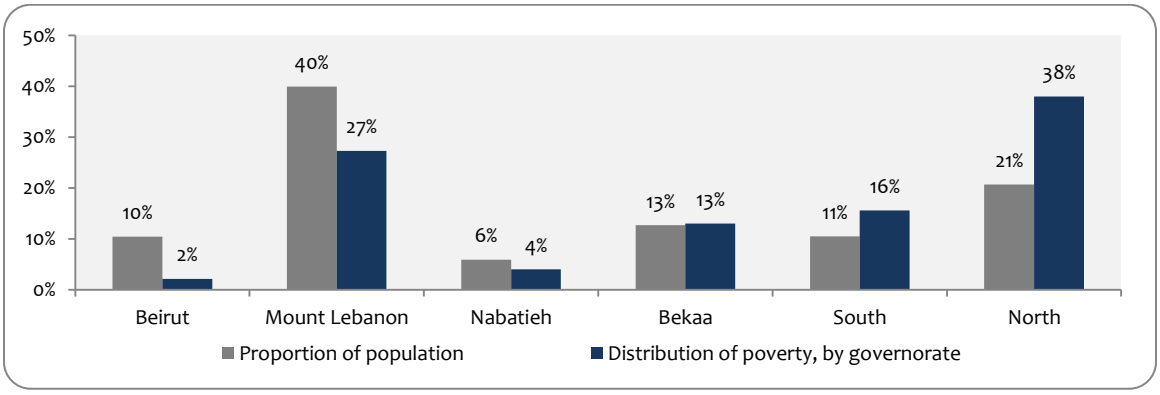
Regional development biases, Urbanization, and Inequality

Regional income inequalities are responsible for a large share of within country income inequalities. This is evident in urban-rural disparities[32] as well as urban-urban and rural-rural inequalities, exacerbated by policy biases in development, regional geographic and demographic features[33], and differences in initial financial conditions of fiscally decentralized regions, for example between different provinces or states.

Literature shows a direct positive relationship between urbanization and rural-urban inequality, albeit at varied magnitudes in countries at early stages of development[34] and inconclusively in developed economies. This relationship is attributed among other factors to employment shifts from lower to higher value added sectors, namely from agriculture to manufacturing at early stages of development, and to the increase in relative incomes of rural economies at later stages. Our data on lower income economies is broadly in line with theory and empirical evidence that urbanization is positively associated with higher inequalities. Countries above the GDP per capita median also show higher measures of inequality[35] with higher rural population ratios, diverging from the notion that inequality decreases at later stages of urbanization. However, the robust negative link between rural population ratios and GDP per capita (-0.65) in lower income economies strongly supports the economic benefits of urbanization. This is also evident in the equivalent positive relationship between manufacturing value added to GDP and GDP per capita, supporting literature on industrialization and the alleviation of poverty[36].

Recent statistics on regional income distribution in Lebanon is scarce. Data from a 2008 study[37] that utilizes Lebanon's 2004-2005 national household survey reveals high regional disparities in terms of poverty (Figure 12). Although the figures are now dated, it is fair to assume that with little region-specific development policies since, regional inequalities have remained largely unchanged with a likelihood of also having widened after 2011, owing to the uneven regional effect of the Syrian conflict and the concentration of refugees in regions where poverty is extensive[38].

Figure 12: Distribution of population and poverty across governorates



Source: Poverty, Growth, and Income Distribution in Lebanon, UNDP (2008).

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[35] Kuznets, S. (1955), Barro R.J. (2000).
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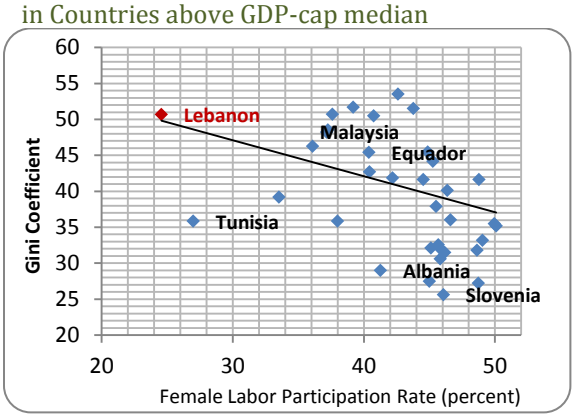
Female Labor Participation Supports Growth and Narrows the Overall Income Gap

Gender parity is an essential component in economic growth and social equity. Studies on the participation of females in the labor force have identified cyclical relationships between female to male employment and gender wage gaps, whereby low female participation in the labor force reinforces pay inequality and overall income inequality. Lower participation rates have as a result been associated with below potential economic growth[39], higher informality[40]. Studies have also shown that women are likely to invest more of their income in the education of their children compared to men[41], further supporting inclusive growth.

Our data indicates an evident negative relationship between female labor participation and income inequality (-0.31) and a positive relationship with GDP per Capita (0.28) in higher income economies, coinciding with literature on the benefits of female participation to growth and equality[42]. However, the relationships are reversed in lower income economies whereby female labor participation correlates with lower growth (-0.35) and higher inequality (0.15). This counterintuitive result, similarly attained by previous studies, has been attributed to the concentration of female employment in low value added sectors[43] and to culturally reinforced gender biases that overshadow the positive impact of participation rates. Survey data finds that an estimated 43 percent of females in lower income countries are employed in agriculture, and face major constraints compared to their male counterparts in terms of allocation of resources (land, equipment) and access to financing[44].

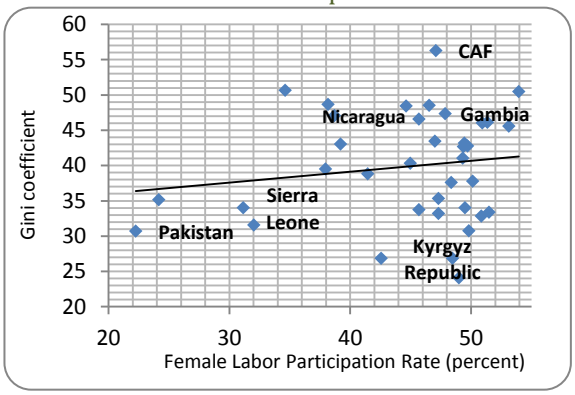
Lebanon's female labor participation as a percent of total female working-age population was around 24 percent[45] in 2014, well below the world median of 44 percent. Moreover, the female to male primary and secondary school enrolment ratio was estimated at 0.95[46], compared to a world median of 0.99 and ranking at 142 of 177 countries in terms of gender education parity, reflecting a high potential for yet untapped economic and societal gains from the promotion of gender equality in terms of employment and access to education.

Figure 13: Inequality and Female Labor in Countries above GDP-cap median



Source: ILO, World Bank, UNDP calculations.

Figure 14: Inequality and Female Labor in Countries below GDP-cap median



Source: ILO, World Bank, UNDP calculations.

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V. Concluding Remarks and Recommendations

This paper assessed private sector labor income distribution in Lebanon using data on an estimated 31 percent of the Lebanese labor force. Results showed that income distribution in Lebanon is highly unequal with the top 2 percent income group accounting for a level of income comparable to that of the bottom 60 percent. The calculated Gini coefficient placed Lebanon at a rank of 129 from 141 countries in terms of income equality.

The need to address income inequality and ensure that it does not widen further could prove a major challenge for Lebanon. And while income inequality cannot be adjusted to desirable levels over a short period of time owing to long term structural determinants, there exist viable policies to promote growth and income convergence in the medium term.

The regional crisis that began in 2011 and the influx of more than 1 million refugees up to 2016[47] contributed to expanding an already large informal sector, creating a more challenging labor market environment. Resolving the challenges of underemployment and downward pressure on incomes will in part require creation of new employment opportunities. This can be partly achieved by easing constraints for the creation of new private sector small and medium businesses. Simpler procedures, clear and transparent regulation, and a better-enforced rule of law, will help promote inclusive growth by reducing informality, curbing the incidence of monopolies, and regulating the labor market.

Likewise, with Lebanon at the cusp of introducing the capital-intensive petroleum sector into its economy, business as usual policies and lack of action could risk further expansion in income inequalities. Economic growth linked to the sector could disproportionately spill over into better-positioned businesses, industries, and labor, while subsequent inflationary pressures reduce overall real disposable incomes. Here, regulatory reforms to limit any potential rise of sectorial monopolies will be essential on the larger scale. Moreover, the promotion of adequate skills through general and vocational education in order to improve domestic labor participation could prove essential in supporting inclusive long term growth.

Female labor participation in Lebanon's formal sector remains extremely low, limiting substantial benefits to productivity, growth, income convergence, and social equity. The channels through which Lebanon could address its low female participation rates are varied, and include the introduction of policies that directly foster female employment in the private and public sectors and the promotion of female education.

Finally, with stark regional inequalities in terms of employment, development, and the provision of public services, high economic and social gains can be derived from sustainable public investments, and policies that promote private ventures in both rural and underdeveloped urban districts across the country.

[47] United Nations Higher Commissioner for Refugees (UNHCR).

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Annex

Table 4: Labor income distribution based on personal income tax declarations[1] (2014)

Income brackets (LL million)	Number of taxpayers	Declared income (LL billion)	Declared income tax (LL billion)	Effective tax rate
< 6	61,485	204	1	0.5%
6-15	207,619	2,085	11	0.5%
15-30	105,969	2,234	48	2.2%
30-60	52,948	2,190	108	4.9%
60-120	21,873	1,784	154	8.6%
> 120	7,425	1,778	274	15.4%
Total	**457,319**	**10,275**	**596**	**5.8%**

Source: Ministry of Finance

(1) These include Income Tax on Wages and Salaries as well as Income Tax on Profits' declarations

Table 5: Labor income distribution based on income tax on wage declarations (2014)

Income Brackets (LL million)	Number of Taxpayers	Income Declared (LL billion)	Income Tax Declared (LL billion)	Effective tax rate
< 6	39,113	124	1	0.7%
6-15	170,704	1,730	9	0.5%
15-30	91,101	1,926	40	2.1%
30-60	45,060	1,861	89	4.8%
60-120	18,084	1,470	123	8.3%
> 120	5,217	1,153	167	14.5%
Total	**369,279**	**8,264**	**429**	**5.2%**

Source: Ministry of Finance

Table 6: Labor income distribution based on income tax on profits declarations (2014)

Income Brackets (LL million)	Number of Taxpayers	Income Declared (LL billion)	Income Tax Declared (LL billion)	Effective tax rate
< 6	22,372	80	0	0.0%
6-15	36,915	355	2	0.5%
15-30	14,868	308	8	2.7%
30-60	7,888	328	19	5.8%
60-120	3,789	314	31	9.8%
> 120	2,208	625	107	17.1%
Total	**88,040**	**2,010**	**167**	**8.3%**

Source: Ministry of Finance

Table 7: Countries used in Cross-Correlation Analysis

Countries by GDP Per Capita Below the Median of USD 3,670	Countries by GDP Per Capita Above the Median of USD 3,670
Burundi	Albania
Benin	Argentina
Burkina Faso	Armenia
Bolivia	Azerbaijan
Bhutan	Bulgaria
Central African Republic	Belarus
Cameroon	Brazil
Ethiopia	Chile
Ghana	Colombia
Guinea	Costa Rica
Gambia, The	Ecuador
Guatemala	Estonia
Honduras	Georgia
Indonesia	Croatia
India	Hungary
Kenya	Jamaica
Kyrgyz Republic	Sri Lanka
Cambodia	Lithuania
Moldova	Latvia
Madagascar	Lebanon
Mozambique	Mexico
Malawi	Mongolia
Niger	Mauritius
Nicaragua	Malaysia
Nepal	Namibia
Pakistan	Panama
Philippines	Peru
Rwanda	Poland
Senegal	Paraguay
Sierra Leone	Romania
Togo	Russian Federation
Timor-Leste	El Salvador
Tanzania	Slovenia
Uganda	Thailand
Ukraine	Tunisia
Vietnam	Uruguay
Zimbabwe	South Africa

Note: Countries are classified according to their 2014 GDP per Capita at constant 2010 prices.
Source: World Bank