

Causes and Consequences of the Income Inequality in Kurdistan region of Iraq during 2018

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ABSTRACT

In the current paper, statistical measurement is employed to ascertain the status of the income deviation; its causes and consequences on the social groups in the Kurdistan region of Iraq during 2018. Furthermore, possible costs and benefits of income inequality in the region has been determined and evaluated. Using the data set from a 2351 households' income and expenditure survey conducted in 2018, by the research's team in the city of Erbil – Iraq. The results showed that there was an exacerbation of the income inequality among the lower income bracket, in particular, occurred. The results also show that factors, inter alia, the drop-in oil prices, the major national revenue; political differences between the Kurdish Regional Government and the Central Government of Iraq which led to the cut off the region's budget by the Central Government of Iraq; an unproductive remuneration policy i.e. the wages and salaries were not always reflecting the work productivity which has been taken place so far and population growth were the major drivers on the divergence of income distribution. The analysis of the impacts of unequally distributed income on social groups shows a deterioration of the well-being of the population; an increase in criminal activities and widespread corruption in the region.

Keywords: *Personal Income, Inequality, Robin Hood Index; Wealth and their Distribution.*

المستخلص

في ورقة البحث الحالية ، تم استخدام الأساليب الكمية لدراسة عدالة توزيع الدخل ، أسبابه وعواقبه على الفئات الاجتماعية في إقليم كردستان العراق خلال سنة 2018. إضافة الى ذلك، تم تحديد وتقييم السلبيات و الايجابيات المحتملة لعدم المساواة في توزيع الدخل في المنطقة. في البحث الميداني للدراسة استخدم البحث مجموعة البيانات المجمع من مسح الدخل والإنفاق الأسري والذي بلغ 2351 أسرة لسنة 2018 في مدينة أربيل أظهرت نتائج البحث أن هناك تفاوتاً ملموساً في عدم المساواة في توزيع الدخل بين شريحة الدخل المنخفضه على وجه الخصوص. كما ظهر من النتائج أن هناك عوامل أخرى مثل الإنخفاض الحاد في أسعار النفط و التي تمثل الإيرادات الرئيسية للحكومة، الخلافات السياسية بين حكومة إقليم كردستان والحكومة المركزية في العراق ، قطع ميزانية الإقليم من قبل الحكومة المركزية العراقية ، كما أن سياسة الإجورالغير الرشيدة التي كانت معمولة بها حتى الآن بالإضافة الى الانفجار السكاني كلها تعتبر من العوامل الرئيسية التي أدت الى عدم عدالة التوزيع في الدخل. أظهرت نتائج البحث أن هناك تدهوراً ملموساً في رفاهية السكان وزيادة الأنشطة الإجرامية وانتشار الفساد الإداري. فيما يتعلق بطرح سياسة مناسبة لإعادة توزيع الدخل نوصي بأن تقوم حكومة إقليم كردستان بصياغة إستراتيجية شاملة تهدف الى المساوات في توزيع الدخل، التركيز بشدة على مكافحة الفساد داخل مؤسسات القطاع العام، حل المؤسسات العامة غير المنتجة، تبني مبادئ

اقتصاد السوق، تشجيع مبدأ "دعه يعمل" ، تعزيز روح المبادرة وريادة الأعمال لدى الشباب وإتباع سياسة دخل لصالح الفقراء.

2. INTRODUCTION

The current research paper aims to analyze the status of income deviation and its causes and consequences on social groups in the Kurdistan Region of Iraq. Furthermore, the possible costs and benefits of the income inequality in the region has been determined and evaluated. In 2018, the research team conducted a household survey in the city of Erbil as representative for the region as a whole.

The survey's questionnaire has been designed to obtain sophisticated social and economic data such as employment status; income level; savings; borrowings; educational level; age; property owned; marital status; number of children; number of rooms shared; quality of eatery and clothing. Based on the survey's data the research attempts, among others, to capture the quantity of monetary income in order to determine the causal nexus between the state of living condition of economic units and equally or unequally distribution of the available income in the region. Thus, these findings can serve as an important tool to identify factors that should to be implemented by policymakers in order to avoid social injustice and its impacts.

The concept of income adopted in this research, however, does not takes in to account the 'Ration Card System' that can be regarded as an additional monetary income for households, since the ration reflects the price of basic foods that are distributed free of cost by the government to a vast majority of the households since the Gulf War in the 1990.

The research paper is comprised of seven sections. After a brief presentation of the research's Abstract in section one, Section two begins with an introduction. Section three discusses the literature review. Section four explains briefly the theoretical framework of the income measurement, together with its practical application for the quantification of the income distribution in the city of Erbil. In section five, we focus on the main causes and consequences of income inequality and their impacts on the wellbeing of social groups. Section six, chronologically analyzes the major elements of costs and benefits of the income deviation on the economic development as a whole. In section seven, the conclusion of the research is followed by the presentation of the major findings and suggestions of suitable strategies to mitigate the burden of income inequality on the vast majority of the population.

3. Literature Review:

The extend of income inequality, its drivers and consequences in both developed and developing nations are seen as major obstacles behind economic growth and the causation of widespread spatial poverty (IMF, June 2015: 5-9). In contrast to developed nations, the causes and consequences of income inequality issues have become an "epidemic" in the new millennium in developing nations, which impacts affect almost all segments of the economy. Policymakers in these nations, including nations which are presently involved in conflict, such as the Republic of Iraq, are facing tremendous challenges in how to formulate and implement an effective policy to best control this widespread "epidemic" in such unstable and unpredictable situations.

Regarding the income inequality, Boulier (1975:210-211) stated that population growth is one of the main factors leading to an augmentation in income inequality in developing countries. In an empirical analysis on the subject, he tested the interrelationship between rapid demographic growth and the state of income equality by relaying on the

comparison of the outcome of the Gini coefficient, which measures the degree of income inequality and the fertility coefficient. He came to the conclusion that the value of the Gini coefficient is greater than the value of the fertility coefficient, hence, according to Boulier, it signifies a less equal income distribution. In other words, the higher the fertility figure, the less equally the income is distributed.

Wage differentiation between the public sector and private owned enterprises in developing countries leads to an increase of income inequality. It is a fact that in these countries the public sector is dominated and it offers its employees relatively higher wages than its private sector counterpart. The main reason is that the public sector's policy aims to combat unemployment rather than tying its wage setting to the work productivity as usually the private sector implements (Caponi, 2017:1). Ultimately, the adaptation of the wage differentiation policy and the competition for skilled workers in an economy lead not only to an augmentation of income inequality but also to a spatial disparity and unbalanced industrial development.

IM, H. and McLaren (2015: 33) advocate that the foreign direct investment (FDI) can be regarded as an "engine" for growth; job creation; lessening inequality of income distribution and combating poverty. Basu and Guariglia (2003:169-170) and TE. Velde (2004:25), however, argue that although the FDI can have a positive impact on some macroeconomic variables such as growth and employment in developing countries, it is also a source of a further increase to the already existing poverty status and income inequality in these countries (Agarwal and Atri, 2015: 30-31).

Crime can be regarded as a by-product of income inequality in a population. Its economic and social consequences have been a core subject of numerous empirical studies (Rufrancos, et al, 2013:7). Chiu and Madden (1997:17-18) and Niemeyer (2005:10-11) statistically analyzed the nexus between income inequality and property crime. They confirmed that property crime is correlated with the distribution of income and wealth. Furthermore, a World Bank group (Fajanylber, et al, 2002: 1-31) found in their research on "Inequality and Violent Crime", the existence of a strong positive correlation between income inequality and violent crime activity across countries. In contrast to the developing nations, the destructive consequences of income inequality including drug trafficking; robbery and corruption in most of the developed industrial world has been recognized by policymakers in its early stages of development and remedial programs have been implemented to control and overcome this phenomenon.

Birdsong (2015:1); OXFAM (2013:2) and McAdams (2007:3) advocate, In a longer term prospective there is a negative correlation between growth and income inequality in an economy where wages and salary rates are growing under proportional to an increase of the inflation rate, lower income populations are no longer able to cope with the raising prices of commodities, particularly if their income is not indexed with the increasing inflation rate (Habib, 1987:70). Consequently, the purchasing power of this income bracket declines. Lack of incentives and flexible wages lowers the motivation of the work-force and generates frustration, which causes ineffective participation in the production process and in turn a reduction of Gross Domestic Product (GDP).

4. Theoretical Framework of the Income Measurement and its application for the city of Erbil.

In the economic literature, there are numerous models for quantification of income distribution as well as a family of Gini's for measuring the inequalities in an economy. In the present paper, however, we are only employing the Lorenz and Gini models for a better graphical representation of the income distribution in

Kurdistan Region and portray the observed income distribution and compare it to a state of perfect income equality. The above-mentioned models are convenient for analysing our research data base since all other measurement models deliver a similar mathematical metric outcome (Klieber, 2005:97-117). Furthermore, “Robin Hood Index” is used to evaluate the state of income inequality aiming to explore income equality.

4.1. Determination of income distribution through Lorenz Curve.

The research team utilized the properties of the Lorenz Curve and the Gini Index for the quantification of inequality and the income distribution in the city of Erbil. For this purpose, we designed Table No.1 to incorporate the data base obtained by our case study.

Table No.1: The income distribution in the city of Erbil

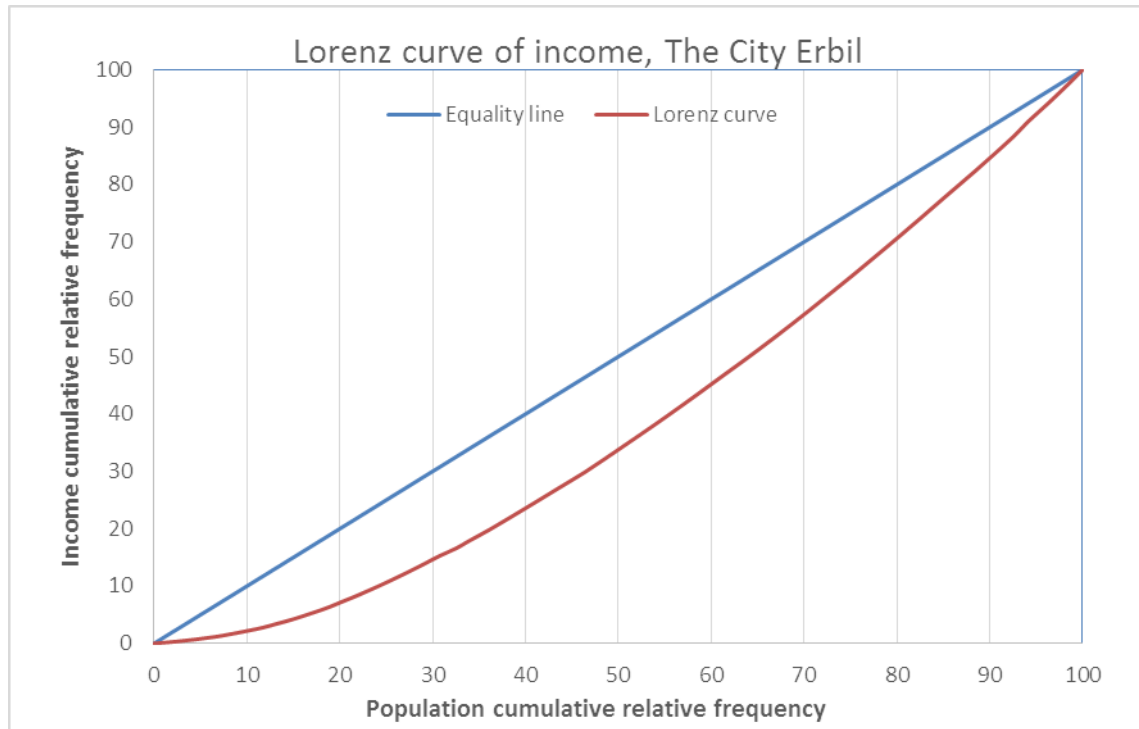
Population Distribution				Income Distribution			
No.	Class Intervals (IQD 1000)	Number of families-par class	Population relative frequency	Population cumulative frequency	Total income par class (IQD 1000)	Income relative frequency	Income cumulative frequency
	0	0	0	0	0	0	0
1	< 500	40	1.7	1.7	18 000	0.226	0.226
2	500-599	30	1.276	2.976	16 500	0.207	0.433
3	600-699	32	1.36	4.336	19 200	0.241	0.674
4	700-799	34	1.44	5.776	23 800	0.299	0.973
5	800-899	29	1.23	7.006	23 200	0.291	1.264
6	900-999	20	0.85	7.856	19 000	0.238	1.502
7	1000-1099	23	0.978	8.834	24 150	0.303	1.805
8	1100-1199	28	1.19	10.024	29 400	0.369	2.174
9	1200-1299	32	1.36	11.384	36 800	0.462	2.636
10	1300-1399	14	0.595	11.979	18 900	0.237	2.873
11	1400-1499	19	0.808	12.787	28 500	0.358	3.231
12	1500-1599	41	1.74	14.527	61 500	0.772	4.003
13	1600-1699	17	0.723	15.25	28 050	0.352	4.355
14	1700-1799	19	0.808	16.058	33 250	0.417	4.772
15	1800-1899	20	0.85	16.908	37 000	0.465	5.237
16	1900-1999	22	0.937	17.845	40 700	0.511	5.748
17	2000-2099	26	1.11	18.945	52 000	0.653	6.401
18	2100-2199	33	1.4	20.345	74 250	0.933	7.334
19	2200-2299	26	1.11	21.455	58 500	0.735	8.069
20	2300-2399	31	1.32	22.775	72 850	0.915	8.984
21	2400-2499	30	1.28	24.055	73 500	0.923	9.907
22	2500-2599	35	1.49	25.545	89 250	1.121	11.028
23	2600-2699	39	1.66	27.205	103 350	1.298	12.326
24	2700-2799	44	1.87	29.075	121 000	1.52	13.846
25	2800-2899	41	1.74	30.815	116 850	1.468	15.314

Table 1. Continued.

26	2900-2999	40	1.7	32.515	100 000	1.256	16.57
27	3000-3099	35	1.49	34.005	106 750	1.366	17.936
28	3100-3199	49	2.14	36.145	151 900	1.909	19.845
29	3200-3299	53	2.25	38.395	172 250	2.164	22.009
30	3300-3399	58	2.47	40.865	191 400	2.405	24.414
31	3400-3499	61	2.65	43.515	207 400	2.606	27.02
32	3500-3599	66	2.81	46.325	221 100	2.778	29.798
33	3600-3699	69	2.93	49.255	251 850	3.165	32.963
34	3700-3799	71	3.02	52.275	266 250	3.346	36.309
35	3800-3899	74	3.14	55.415	281 200	3.534	39.843
36	3900-3999	68	2.89	58.305	265 200	3.333	43.176
37	4000-4099	77	3.27	61.575	308 000	3.871	47.047
38	4100-4199	82	3.48	65.055	328 000	4.122	51.169
39	4200-4299	88	3.74	68.795	369 600	4.645	55.814
40	4300-4399	80	3.4	72.195	348 000	4.373	60.187
41	4400-4499	76	3.23	75.425	338 200	4.25	64.437
42	4500-4599	79	3.36	78.785	359 450	4.517	68.954
43	4600-4699	81	3.44	82.225	376 650	4.733	73.687
44	4700-4799	63	2.67	84.895	299 250	3.761	77.448
45	4800-4899	84	3.57	88.465	394 800	4.961	82.409
46	4900-4999	89	3.78	92.245	436 100	5.48	87.889
47	5000-5099	45	1.91	94.155	247 500	3.11	90.999
48	5100-5199	54	2.29	96.445	270 000	3.393	94.392
49	5200-5299	49	2.08	98.525	257 250	3.233	97.625
50	> 5300	35	1.48	100	189 000	2.375	100
	Σ	2351	100		7 956 600	100	

Source: Designed by the research's team on the basis of the research's data.

Graphic No.1: The Lorenz Curve of the City of Erbil



Source: Designed by the research’s team based on the research’s data.

The income inequality in the city of Erbil can be followed up by evaluating the Table No.1 above. We observe that the individual families whose disposable income does not exceeds (500 000) Iraqi Dinars per month constitute (1.7 %) of the total population, merely receive (0.23 %) of the total disposable income, while households in the next income category (1000 to 1099) Iraqi Dinars constitute (0.98 %) of the total households but receive (0.3%) of the total disposable income. In contrast, households with the highest income category who receive more than (53000) Iraq Dinars per month constitute (1.48) % of the total population and receive (2.4 %) of total disposable income.

4.2. Determination of income distribution through the Gini Index

The determination of state of income by Gini Index calculation can be achieved by supplying the data base in Table No.2. The Gini coefficient which we have here adopted is a variant model from Dalal (2017: 2-6) that can be written below as:

$$G = 1 - \frac{1}{10000} \sum_{i=1}^n (P_i - P_{i-1}) (L_i + L_{i-1})$$

Where: G=the Gini Index i.e. the Gini coefficient:

P=Cumulative frequency of population

L=Cumulative frequency of income

$$G = 1 - \frac{1}{10000} \sum_{i=1}^n (P_i - P_{i-1}) (L_i + L_{i-1}) = \frac{7754.9639}{10000} = 0.77549639$$

(Refer, to the calculation in the last column of the table below).

G=1-0.77549639=0.2245 and the Gini index is = 22.5%

The above obtained value of the Gini index in Erbil - North of Iraq indicates that the inequality in this area of the world is lesser than the national level of the rest of Iraq, which is estimated at (27.5%) World Bank (2007-2012:5). In this context a Gini index value, which is lower than a numerical value, of, (35%) may not be necessarily regarded as a severe poverty indication (Malte, 2010:5-7).

Table No.2: Income Distribution in Erbil (Extract from Table No.1)

No.	Class intervals	Total income par class (ID 1000)	Number of family's par class	Income - relative frequency	Income - cumulative frequency (Li)	Income cumulative frequency (Li+Li-1)	Population relative frequency	Population cumulative frequency (Pi)	Population cumulative frequency (Pi-Pi-1)	Calculation of the Gini coefficient
	0	0	0	0	0	0	0	0	0	0
1	< 500	18 000	40	0.226	0.226	0.226	1.7	1.7	1.7	0.3842
2	500-599	16 500	30	0.207	0.433	0.659	1.276	2.976	1.276	0.840884
3	600-699	19 200	32	0.241	0.674	1.107	1.36	4.336	1.36	1.50552
4	700-799	23 800	34	0.299	0.973	1.647	1.44	5.776	1.44	2.37168
5	800-899	23 200	29	0.291	1.264	2.237	1.23	7.006	1.23	2.75151
6	900-999	19 000	20	0.238	1.502	2.766	0.85	7.856	0.85	2.3511
7	1000-1099	24 150	23	0.303	1.805	3.307	0.978	8.834	0.978	3.234246
8	1100-1199	29 400	28	0.369	2.174	3.979	1.19	10.024	1.19	4.73501
9	1200-1299	36 800	32	0.462	2.636	4.81	1.36	11.384	1.36	6.5416
10	1300-1399	18 900	14	0.237	2.873	5.509	0.595	11.979	0.595	3.277855
11	1400-1499	28 500	19	0.358	3.231	6.104	0.808	12.787	0.808	4.932032
12	1500-1599	61 500	41	0.772	4.003	7.234	1.74	14.527	1.74	12.58716
13	1600-1699	28 050	17	0.352	4.355	8.358	0.723	15.25	0.723	6.042834
14	1700-1799	33 250	19	0.417	4.772	9.127	0.808	16.058	0.808	7.374616
15	1800-1899	37 000	20	0.465	5.237	10.009	0.85	16.908	0.85	8.50765
16	1900-1999	40 700	22	0.511	5.748	10.985	0.937	17.845	0.937	10.292945
17	2000-2099	52 000	26	0.653	6.401	12.149	1.11	18.945	1.1	13.3639
18	2100-2199	74 250	33	0.933	7.334	13.735	1.4	20.345	1.4	19.229
19	2200-2299	58 500	26	0.735	8.069	15.403	1.11	21.455	1.11	17.09733
20	2300-2399	72 850	31	0.915	8.984	17.053	1.32	22.775	1.32	22.50996
21	2400-2499	73 500	30	0.923	9.907	18.891	1.28	24.055	1.28	24.18048
22	2500-2599	89 250	35	1.121	11.028	20.935	1.49	25.545	1.49	31.19315
23	2600-2699	103 350	39	1.298	12.326	23.354	1.66	27.205	1.66	38.76764
24	2700-2799	121 000	44	1.52	13.846	26.172	1.87	29.075	1.87	48.94164
25	2800-2899	116 850	41	1.468	15.314	29.16	1.74	30.815	1.74	50.7384

Table No.2 continued

26	2900-2999	100 000	40	1.256	16.57	31.884	1.7	32.515	1.7	54.2028
27	3000-3099	106 750	35	1.366	17.936	34.506	1.49	34.005	1.49	51.41394
28	3100-3199	151 900	49	1.909	19.845	37.781	2.14	36.145	2.14	80.85134
29	3200-3299	172 250	53	2.164	22.009	41.854	2.25	38.395	2.25	94.1715
30	3300-3399	191 400	58	2.405	24.414	46.423	2.47	40.865	2.47	114.66481
31	3400-3499	207 400	61	2.606	27.02	51.434	2.65	43.515	2.65	136.3001
32	3500-3599	221 100	66	2.778	29.798	56.818	2.81	46.325	2.81	159.65858
33	3600-3699	251 850	69	3.165	32.963	62.761	2.93	49.255	2.93	183.88973
34	3700-3799	266 250	71	3.346	36.309	69.272	3.02	52.275	3.02	209.20144
35	3800-3899	281 200	74	3.534	39.843	76.152	3.14	55.415	3.14	239.11728
36	3900-3999	265 200	68	3.333	43.176	83.019	2.89	58.305	2.89	239.92491
37	4000-4099	308 000	77	3.871	47.047	90.223	3.27	61.575	3.27	295.02921
38	4100-4199	328 000	82	4.122	51.169	98.216	3.48	65.055	3.48	341.79168
39	4200-4299	369 600	88	4.645	55.814	106.983	3.74	68.795	3.74	400.11642
40	4300-4399	348 000	80	4.373	60.187	116.001	3.4	72.195	3.4	394.4034
41	4400-4499	338 200	76	4.25	64.437	124.624	3.23	75.425	3.23	402.53552
42	4500-4599	359 450	79	4.517	68.954	133.391	3.36	78.785	3.36	448.19376
43	4600-4699	376 650	81	4.733	73.687	142.641	3.44	82.225	3.44	490.68504
44	4700-4799	299 250	63	3.761	77.448	151.135	2.67	84.895	2.67	403.53045
45	4800-4899	394 800	84	4.961	82.409	159.857	3.57	88.465	3.57	570.68949
46	4900-4999	436 100	89	5.48	87.889	170.298	3.78	92.245	3.78	643.72644
47	5000-5099	247 500	45	3.11	90.999	178.888	1.91	94.155	1.91	341.67608
48	5100-5199	270 000	54	3.393	94.392	185.391	2.29	96.445	2.29	424.54539
49	5200-5299	257 250	49	3.233	97.625	192.017	2.08	98.525	2.08	399.39536
50	>5300	189 000	35	2.375	100	197.625	1.48	100	1.475	291.496875
	Σ	7 956 600	2351	100		2894.11	100	2031.261		7754.96389

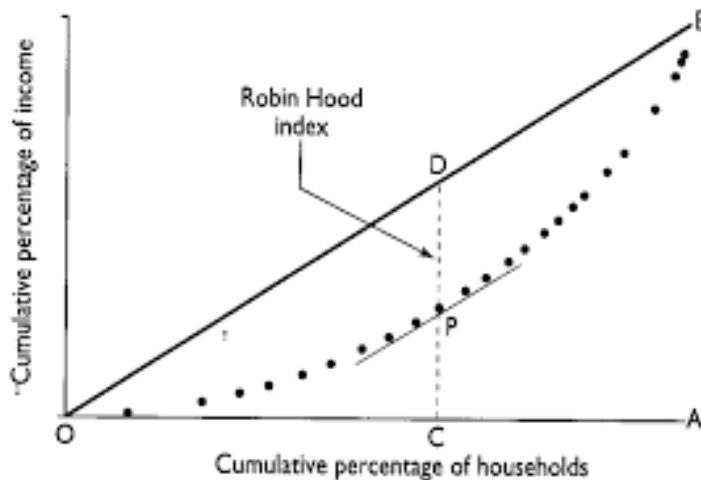
Source: Designed by the research's team based on the research's data.

4. 3. The Robin Hood Index for overcoming the income inequality

4.3.1. The Robin Hood Index (known as Hoover index Model)

This index is an econometrical method that aims to theoretically overcome the state of inequality in an economy, which is formulated and utilized to a great extent by researchers, et al, Byrtusová (2016:31-33); Fuerst (2012:2) and Lapáček (2008:5). The Robin Hood index takes values between 0 (the total income equality) and 100 (the total income inequality). The index can be graphically represented and quantitatively formulated as shown in the Graphic below:

Graphic No 2: Robin Hood Index.



Source: Fuerst (2012:2) and Byrtusova (2015:31-33)

In the graphic, the Robin Hood Index is the maximum vertical distance between the Lorenz curve and the line of “perfect” equality, namely (CD – CP). Accordingly, a higher Robin Hood index value is an indication of a severely unequal distribution of income. This means that a large quantity of income which, equals PD, has to be redistributed if an equality of income in society is to be achieved by policy makers. Quantitatively, the Hoover index (HI), (Robin Hood index) is formulated as follows:

$$HI = \left(\left[\frac{\sum x_i}{\sum x_i} \right] - \left[m * \frac{1}{n} \right] \right) * 100 \quad \text{For } \frac{x_i}{\sum x_i} > \frac{1}{n}$$

Where: x_i = the individual income of the i -th groups,
 n = the number of income groups, (deciles)
 m = is the number of groups which are set off in total sum.

4.3.2. The application of the Robin Hood Index (the Hoover Index) for the income distribution in the city of Erbil.

In order to obtain the Robin Hood Index size, the research’s team followed the approach described below:

1. The households are organized chronologically in accordance with their income brackets, namely from highest income brackets to the lowest one.
2. The total income is divided into 10 equal parts i.e. Deciles.
3. Each part contains 10% of the total observations.
4. Deciles where their percentages of total income exceed a 10% threshold (=M), indicate an asymmetric distribution of the income as shown in the table below:

Decile (n)	1	2	3	4	5	6	7	8	9	10
(xi) Percentage of total income	24.3%	20.3%	16.8%	14.0%	9.4%	5.9%	4.0%	2.2%	1.6%	1.5%
M	24.3%	20.3%	16.8%	14.0%						

The derivation of Robin Hood index for the city of Erbil can be obtained par equation mentioned above as:

The Robin Hood Index = (24.3%+20.3%+16.8%+14.0%) = 75.4% - (4*10%) =35.4%.
 The Robin Hood Index that we were able to quantitatively determine is the approximate fraction of the total disposable income that needs to be redistributed from households with above average income to the households below the average income, which is also visually indicated through the maximal vertical distance between the Lorenz curve and the line of

the income equality (points P and D), (refer to Graphic No.2, page No.9). This conclusion indicates that the policy makers are able to achieve the income equality in the society (the idea of Robin Hood) if they are willing to pursue an effective income policy.

5. Causes and consequences of the income inequality

5.1. Causes of income inequality

5.1.1. Unequal distribution of wealth

In most developing countries (for instance, India and China) the distribution of assets is varied, due to among others, the divergence of the income distribution and the monopolistic power of the political and caste systems who own agriculture land or are able to benefit from large industrial projects (Zacharias and Vakulabharanam 2009:3-8, and Zang. et al, 2010:2-5). In the City of Erbil on the other hand, the drivers of the income inequality and wealth distribution are rather multifold. We are aiming to locate the main factors that might contribute to causation and levitation of the estate of the income inequality and wealth in the region. For this, we are following up the data-base in Table No. 3 below in order to know how the wealth is distributed among the population in the city of Erbil. Further analysis focuses on the evaluation of the sources that are considered to be the root of inequality creation.

Table No.3: Distribution of wealth in the city of Erbil

Total income par class (Iraqi Dinars)	No. of Population	Own a house	%	Own a Car	%	Poses a Phone	%	Poses a PC	%
400 000 - 1 000 000	192	104	54.2	108	56.3	487	253.6	90	47.7
1 000 000 – 2 000 000	203	154	75.9	188	92.6	656	323.2	129	64.4
2 000 000 – 3 000 000	162	150	92.6	64	39.5	193	119.1	46	28.4

Table No.3: Continued.

3 000 000 – 4 000 000	127	120	95.8	31	24.4	95	75.0	27	21.3
4 000 000 – 5 000 000	49	94	100.0	19	38.8	51	104.1	17	34.7
>5 000 000	3	3	100.0	6	200	16	533.3	6	200.0
Σ	736	313		416		1498		315	

Source: Designed by the research's team based on the research's data.

Table No. 3 provides us with a picture of wealth distribution in the population of individual income brackets. As can be seen from the table that:

1. In contrast to the higher income population, the lower income earner groups are relatively higher populated with lower shares of wealth.
2. The majority of lower income brackets who own a house are, financed through borrowing from the government scheme, the so-called 'Al ikari' or "Real Estate Credit".
3. Lower income brackets mostly use their vehicles for private transport as well as for taxi business as a second source of income in order to be able to, among others, repay borrowed money from the government or to finance the education of their children in private universities.
4. Most of the lower income groups own two or more phones of which one is for private use only and the other for businesses communication.

5.1.2. Remuneration versus education

North American researchers, among others, (Gramlich and Long 1996:1-3, Yoshialki and Grossman 2002: 16-18) are of the opinion that one of the main reasons for income inequality in the United States of America is the growing returns on education. The remuneration gap between the skilled and unskilled workforce plays an important role for

the divergence of income distribution in developing countries as well. The Republic of Iraq, is one of the leading oil exporting countries in the world and, its revenue mainly depends on oil exports. Iraq uses oil revenues to finance its expenditures, which includes investing in public infrastructure; promoting public companies and paying the wages and salaries of public employees. This expenditure policy contributed to a domination of the public sector in the economy. For better management of the public sector, the government of Iraq encouraged educated human capital to be associated with this sector by offering them a higher remuneration and lucrative incentives. The wage and salary scheme for educated individuals who are employed for the first time, vary between 185,000 and 443,000 Iraqi dinars a month, (see Table No.4). Furthermore, monthly incentives are paid depending on the level of education, which varies from 15 % to 200 % of the base salary. Public employees are also offered a free house or a property and a real estate credit scheme (Public employee law No.22 of 2008, Central Bureau of Statistics 2008). This package of incentives attracted young academics to be employed by the public sector, (refer to Table No. 5 and associated Figure No.1). The dominance of the public sector had, in turn, a disadvantageous effect on the evolution of the private sector, as well as wage discrepancies between private and public sectors, which mainly contributed to income inequality among the vast majority of the population.

Table No.4: Represents a summary of the payroll scheme for the public employees in Iraq (1000 Iraqi Dinars). Which indicates that the higher individuals are educated the higher reward will be.

Illiterate individuals	Primary School	Intermediate School	High School	Technical Institutions	Bachelor Degree	Medical Education	Master's	PhD
140	152	185	240	260	296	362	374	443

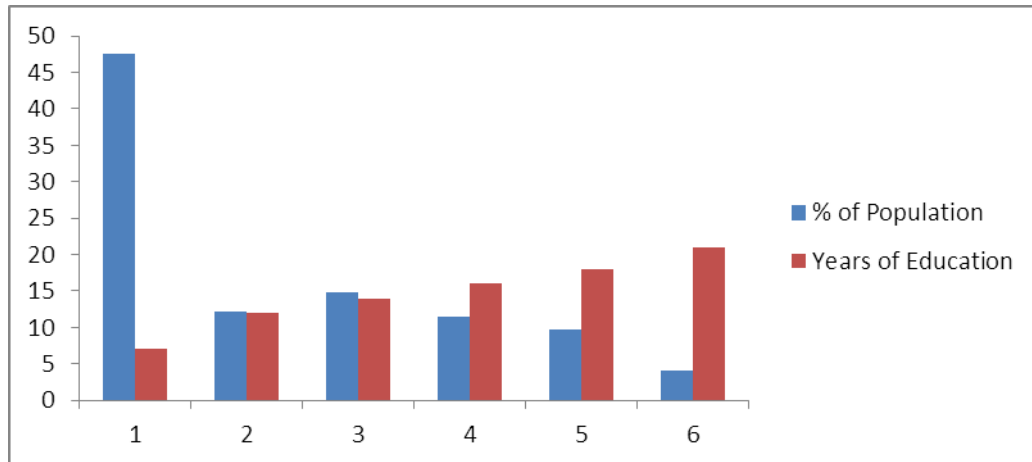
Source: Central Bureau of Statistics. Baghdad 2008.

Table No.5: Relationship between Income and Education Levels in the city of Erbil in 2018.

Total income par class (Iraqi dinars)	School leavers	%	High school	%	Dipl .	%	BSc	%	MSc	%	PhD	%
400 000 - 1 000 000	350	47.6										
1000 000 – 2000 000			90	12.2								
2000 000 – 3000 000					109	14.8						
3000 000 – 4000 000							85	11.5				
4000 000 – 5000 000									72	9.8		
>5000 000											30	4.1
∑	350		90		109		85		72		30	

Source: Calculated by the research's team from original data base.

Figure No. 1: Relationship between Income and Education Levels in the city of Erbil in 2018



Source: Calculated by the research's team by applying data from the table above.

Remark: Columns 1 to 6 are described below:

1= Up to 7 years of education

4=16 years of education

2= 12years of education

5=18 years of education

3=14 years of education

6=21 years of education

5.1.3. Causal nexus between education levels and the child boom in Erbil

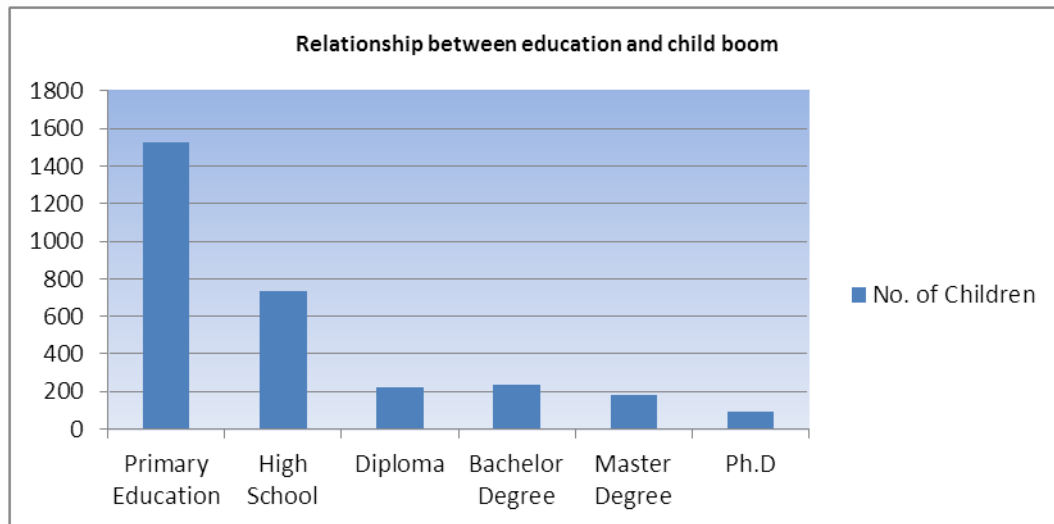
In less developed countries, fertility is inversely related to family income and the education of parents (Boulier, 1975:170-171). The population development policy and poverty control of the Republic of Iraq and in the Kurdish region are rather controversial among the vast majority of lower income brackets and religious scholars. While religious scholars strictly oppose abortion, the lower income receivers want more children. They regard children as valuable assets serving as a future investment to contribute to the family's income. Reading Table No. 6 and associated figure No.2, we can observe that there is a causal nexus between the lower income receivers, i.e., less formally educated individuals, and the child boom in contrast to the higher educated income bracket i.e. that people with lower education have larger family size and vis versa. We conclude that the government should try to control the widespread of poverty instead of managing the child boom. Paradoxically, this indirectly promotes child boom by offering public employees an additional incentive package that contains a monthly 50,000 Iraqi dinars for married couples and 10,000 Iraqi dinars per child.

Table No.6: Relationship between education and child boom in the city of Erbil.

Education	No. of children	AV.	No. of children	AV.	No. of children	AV.	No. of children	AV.	No. of children	AV.	No. of Children	AV.
Primary School	1525	4.4										
High School			732	8.1								
Diploma					224	2.1						
Bachelor Degree							237	2.8				
Master Degree									179	2.5		
PhD											19	0.6
Σ	1525		732		224		237		179		19	

Source: Calculated by our research’s team from research data base.

Figure No 2: Relationship between education and child boom in the city of Erbil. Shows the more individuals are educated the small family size will have.



Source: Calculated by the research’s team from research data base.

5.2. Consequences of income inequality in Erbil

5.2.1. Elevation of criminal activities

In developing countries, poor governance and economic crimes (such as corruption) are still the main obstacles for economic development to progress (Karl, 2007:1-3 and Mashal, 2011:71-73). It is notable to mention that some crimes in many developing countries are anchored in tradition and income inequality leads to a rise in criminality (Bourguignon, 1999:202). In emerging countries, such as the Republic of Iraq, petty crimes are in general punished by law, however, corruption is rather encouraged by influential politicians in order to protect criminals for their own financial benefit or to influence government officials to manipulate the outcome of public tenders for large infrastructure projects. In this context, Cordesman and Khazai (2015:1-3) report on the international ranking of corruption that the Republic of Iraq ranks as 170th out of 175 countries.

The local government of the Kurdistan region has been attempting to eradicate corruption for decades. In 2008, the government launched a campaign to prevent corruption by establishing the so-called “corruption committee”. The main function of the committee was to review the level of corruption in the region and to formulate strategies on how to control corruption. In order to be able to make a constructive recommendation, the committee contracted an international accounting firm to review, among others, the financial operation system of the Kurdistan region government institutions and make suitable recommendation on anticorruption measures.

Nevertheless, since corruption is anchored in local tradition i.e. is a part of the culture of this geographical area of the world, corruption cannot be totally eradicated. According to the official report of the UK Border Agency (2009:130-131) the vast majority of opposition parties in the region are concerned about the state of corruption and the lack of transparency in the Kurdistan region’s budget. These parties have accused the government

of having various corrupt government ministers who are involved in embezzlement activities of public money, while they employ friends or relatives with multiple records and salaries, these types of employees are called “ghost” employees by natives since their names exist only on the payroll. In addition, local business organizations accuse the government of not publishing public tender contracts in a time frame in which enables them to fairly compete with their competitors. However, in 2016 the government introduced a compulsory biometric documentation of all employees of the public sector in order to prevent these “ghost” employees in the region.

5.2.2. Deterioration of the population’s well-being

There is growing evidence regarding the nexus between well-being (objective and subjective well-being) and poverty in developing countries (White et al., 2012: 2-5). The divergence of the income distribution in the Kurdistan region with the events that have been accruing in the region during the period from 1980 to 2018, have had an enormous impact on the state of well-being of the population in Iraq and in the Kurdistan region. The combination of crises, such as the war with Iran; the chemical attack on the Kurdistan region; the Gulf War; comprehensive United Nation sanctions against Iraq; the liberation of Iraq from the Baath regime; the invasion of Islamic extremists in many provinces; the collapse of oil prices, the main source of Iraq’s revenue; wage and salary reductions for public employees, as well as the costly war against international Islamic terrorists, has been all together contributing to the unhappiness and lower well-being of the population as a whole. This has not only affected the present generation but will have a negative impact on the well-being of future generations. Some elements of the objective well-being deterioration have been selectively chosen by the research team, captured in the table below:

Table No.7: Selectively chosen elements of the well-being deterioration in the city of Erbil.

Public health sector status	Financial status
<ul style="list-style-type: none"> . The majority of the population has no access to free, safe and high-quality service in public hospitals. <ul style="list-style-type: none"> . Hospital care facilities suffer from electricity shortage. . Overcrowding hospitals prevents physicians from having adequate time to provide quality care for patients. Consultation lasts maximum two minutes per patient. <ul style="list-style-type: none"> . child mortality levels are very high with dehydration from diarrhea . Lack of ambulance emergency service 	<ul style="list-style-type: none"> . Poverty line in Kurdistan equals to 6.3 per cent (while poverty line in Iraq equals to 18.9 per cent. . 19 per cent of the population are living on less than US\$ 2.2 <ul style="list-style-type: none"> . 6 per cent of the population is food insecure. . Youth unemployment equals to 15.9 per cent.

Source: Shabila (2012:12-21).

6. Costs and Benefits of income variation

6.1. The costs of the income inequality scenario

6.1.1 Income inequality versus growth

The damping impacts of income inequality on economic growth in Kurdistan and in Iraq is well manifested in national and international statistics. Income inequality in an

economy demotivates the workforce to enhance productivity; produces social tension; causes political unrest and economic chaos (Ostry et al, 2004:4-6). In this regard the Trading Economics (Tradingeconomics.com > Iraq.2018:1) reports that the Gross Domestic Product (GDP) growth rate in Iraq has been negatively developing. It decreased namely from 13.9 % in 2012 to only 11 % in 2016. The main reason for lower GDP in the country were among others, Income disparity among the population and the lack of wage incentive which effected the motivation of the workforce to effectively participation in the production process. Lower GDP in tun effected other macroeconomic variables such as the development of unemployment rate and Price level in the economy. According to Trading Economics the unemployment rate averaged around 28.10 % from 2008 to 2016 and the rate of inflation averaged around 10.83 % in 2018.

6.1.2. Income inequality versus crime:

In societies, where the gap between income brackets is mounting, lower income recipients are exposed to unlawful activities to obtain assets in order to compensate for the loss of their living standard. According to (Birdsong (2015:2), there is an inverse relationship between income inequality and the level of crime. In this context kidnapping and bribing activities for money gains are common throughout Iraq. The police force and military units, lack of adequate equipment and proper training, are not capable to effectively combat crimes. According to “Iraq 2017 Crime & Safety Report: Baghdad” which is published by United States Department (OSac.gov/pages/content Report Details.aspx? cid=21351) that Iraq considered to be the least safety country in the Middle East since the crime index in Iraq is overwhelming and it amounts to 56.53 % while safety index estimated to be around to 42.65%. Following up the above-mentioned report, the crime activity in Kurdistan Region is increasing but in a moderate fashion.

6.1.3. Income inequality versus public health:

Income disparity has a positive correlation on the status of public health and the causation of social economic problems (Rowlingson, 2011:2-4). In Iraq as well in Kurdistan Region poor health care can be regarded as one of the by- products of income inequality. According to the World Health Organization (WHO 2017:30-33) increasing rise of cancer rates patients with higher income has to pay high price for travel expenses and for healthcare outside Iraq. The majority of the lower income bracket is not able to afford the cost of a private health care. Instead, they attend public hospitals, which are always crowded, where, the patients have to wait for longer periods of time considering that the specialty doctors are rare. Lower remuneration for doctor staff led ultimately to “brain drain”. The WHO reports that Iraq’s medical doctors to patients’ ratio is 7.8 /10.000 i.e. one physician per 1149 citizens. Since, sick leave is limited or unpaid in developing countries, such as in Iraq and the Kurdistan region, an ailing work force is not able to perform effectively. Consequently, overall work productivity decreases, workers have to leave; unemployment increases and there is a further widening of income inequality (Birdsong, 2015:6).

6.2. The Benefits of the income inequality scenario:

The impacts of a severe income inequality in a country obviously lead to a dissatisfaction of the vast majority of the population in general and the poorest economic units, in particular, as well as manifesting itself in a destabilization of many segments of the economy. Several research studies have come to the conclusion that there is a strong correlation between income inequality and health, social-, educational- and economic problems (Rowlingson, 2012:8). On the other hand, income inequality can serve as an engine of boosting the economy as a whole as explained below:

1. Income divergence motivates risk takers for innovation and establishment of new businesses which in turn lead to growth and an increase of economic advancement.
2. Higher remuneration for company's executives might elevate their performance and economic growth, which may be beneficiary for unemployed individuals.
3. Lower income groups are prepared to do unskilled works such as streets and sewage cleaning, considering that high income earners decline to perform these duties. These activities contribute in turn, to lowering the rate of unemployment and releasing resources that could have been claimed by these groups, for eligible social security receivers.
4. The extent of consumption's expenditure of less income receivers on mainly inferior goods leads to investment and mass production of these goods which enhances the income and growth as well as a reduction of the rate of unemployment (Bergen and Nilsen, 2012:1-2).
5. The low-income earners usually are motivated and may participate in vocational training programs offered by the government or community initiatives in order to obtain new employment with a much higher income or to start a small business entity (Shahab and Habib, 2017:285).

The impact of the income equality on economic development usually depends on the economic system that the individual society chooses. Income equality in socialist economic systems, for instance, might have negative impacts on economic development. In such systems, the wages and salaries are nearly equal and individuals in these societies are economically dissatisfied because of the lack of incentives; inflexible wages and salaries and a lower standard of living, therefore, the individuals feel that there is no prospective to further progress financially. These factors, have notably serious consequences on the acceleration of the wheel of the economy to develop as explained below:

1. Lack of incentives and flexible wages lowers the motivation of the work-force and generates frustration, which causes ineffective participation in the production process.
1. Less motivation causes neglect of the improvement of a product's quality.
2. Individuals are less cooperative and do not follow up instructions, which leads to a restriction in productions quantity, industries being closed down and poverty traps.
3. The absence of private initiatives for innovation projects.
4. Lower saving and higher consumption accelerate the rate of inflation (Habib, 1987:49).

In this context, income equality might have a positive impact on the economic development in a market economy. The income equality in such markets enables individuals to enjoy, among other things, a higher standard of living; the betterment of their well-being and the freedom of consumer sovereignty. The individuals have also equal access to public education; health care and a social security system. Therefore, income equality strongly motivates individuals to significantly contribute to further develop the economic conditions in their countries as explained below:

1. Since individuals are sensitive to incentives and flexible wages and salaries, they should be prepared to effectively participate in the production process in order to further enhance the Gross Domestic Product.
2. A higher Gross Domestic Product, in turn, leads to the expansion of the export sector which contributes to minimize the deficit of balance of payments.
3. To maximize their income, individuals take advantages of the principle of *laissez - faire* to start business entities.
4. Boosting business projects in the community obviously creates income and minimizes the rate of unemployment.

5. Marginal saving in a market economy is much higher than the marginal consumption, which leads to a control of inflation (Habib, 1987:50-51).

7. Conclusion

In this research paper, we compiled a data set from the household income and expenditure survey conducted by our research team in 2018 in the city of Erbil. The aim was to analyze and quantify the possible convergence or divergence of the personal income distribution. For this purpose, we employed statistical measurements of Max Otto Lorenz; Corrado Gini and the Robin Hood Index. We evaluated various the aspects of causes and consequences of income inequality and eventually its costs and benefits for the society as a whole and our findings show that:

1. The Lorenz curve shows that the income in the Kurdistan region is unequally distributed among the whole population. This is evident through the evaluation of the Lorenz curve depicted on page number 6. We have observed that the individual families whose disposable income does not exceeds (500 000) Iraqi Dinars per month constitute (1.7 %) of the total population, merely received (0.23 %) of the total income, while households in the next income category (1000 to 1099) Iraqi Dinars constitute (0.98 %) of the total households but received (0.3%) of the total income. In contrast, households with the highest income category who received more than (53000) Iraq Dinars per month constitute (1.48 %) of the total population and received (2.4%) of total disposable income.
2. The value of the Gini coefficient amounts to (22.5 %), which signifies the existence of an asymmetry in income distribution, since its value is positive and less than the one.
3. The Robin Hood Model that the research team has calculated amounts to (35.4 %) has to be taken in-to consideration by policy-makers in order to be able to effectively level the state of income inequality among the various income brackets (the idea of Robin Hood).
4. The main drivers of the income inequality include unequally distributed wealth; unbalanced wage policy in the public sector and population growth.
5. Factors that threaten the social peace include the elevation of criminal activities and the deterioration of the population's well-being.
6. Unequally distributed income creates costs and benefits for economic and social development.
7. The wide-spread corruption within the public sector paralyzes policy-makers to translate well-formulated economic strategies in-to action plans.
8. Unbalanced industrialization is created by the dominance of the public enterprises and the negligence of private entrepreneurships.
9. For a constructive mitigation of the income inequality, inter alia, it is a sine qua non to introduce the principle of the *laissez faire* and private entrepreneurships.

8. Recommendation

The income distribution policies that the governments of Iraq and the Kurdistan region have been adopting so far, are necessary, but not sufficient to significantly mitigate the burden of the unequal distribution of income of economic units. Thus, policy-makers in the region may draw attention to the research's team formulated strategies mentioned below as a road map for a better control of income divergence and its impacts on social economical groups:

1. The millennium's goal of the government should be the total commitment to the principles of the market economy.
2. Encourage small and midsized entrepreneurships.
3. Wages and salaries should be based on the principles of bargaining strategies.

4. The remuneration of the public sector, including oil industry employees; ministerial portfolios and general managers, should be subject to a productivity performance.
5. To create additional income and employment opportunities, the encouragement of young females and males is required to attend vocational training courses (such as business; craft; communication; trade; building; gastronomy, auto mechanic; IT specialists, electricians; tailors and nurses) provided by the government.
6. Implementation of a micro credit system based on an interest-free loans for young academic entrepreneurs.
7. Introduction of the annual income tax declaration for all individuals in the country.
8. A progressive tax system should be developed for private clinics and hospitals, in particular.
9. To diversify revenue sources, it is inevitable to introduce a value added tax system in order to be able to meet the deficit spending caused by the drastic collapse of oil export revenue as well as to offset as much as possible the budget of the Kurdistan Regional Government which has been cut off by the central government.
10. Provide a constructive incentive system for individuals who are employed in primary sector in order to encourage urban rural migrations; create additional income and reduce the level of unemployment.
11. Encourage young married couples to limit the number of child births.

The road map suggested above should be subject to a yearly revision and amendment by policy-makers.

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