Effectiveness of the Housing Policy: A Comparative Analysis

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Abstract:

Introduction. The quantitative assessment of the housing policy effectiveness in the context of the solving of a housing problem gives the possibility to estimate governments programs and tools in the given area and choose the most efficient of them.

Purpose. Given the lack of the scientific papers devoted quantitative assessments of housing policy, the main purpose of the given article is developing of approach for the numerical estimation the housing policy effectiveness considering the complexity and variety tools which are simultaneously used by the government to solve the housing problem.

Results. Proposed four-level model of the state housing policy allows maximally consider the complexity and ambiguity of the problems which must be solved in housing sphere and takes into account market development (economic efficiency) and performance of the government non-market tools (social efficiency). Using this approach, the effectiveness in 2015 only 14.29% (maximal value 100%) and decreasing trend of the housing policy in Ukraine within 2011-2015 have been received (the effectiveness was 35.7%). The main problems in housing policy in Ukraine were determined as increasing the gap between building activities and possibilities to use of the market and non-market tools to solve housing problems by citizens. Basing on received results concluded that housing policy in the UK has the higher effectiveness than in Ukraine.

Conclusions. The main problem of housing policy in Ukraine was determined as the inconsistency ofthe positive trend inbuilding activity and solving the housing problems of neediest.Received results show that experience and the practical tools which are used in the UK within housing policy will be useful to explore and implementation by Ukraine's Government. Of particular interest are the instruments of transfer of new social and private homes to rent to citizens with limited resources.

Keywords: Effectiveness of the Housing Policy, Housing Problem, Housing Affordability, Mortgage, Social Housing.

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1. Introduction

The housing problem is an important political issue for the government in all countries (Carter and Polevichok, 2004). There are many discussions in the scientific community concerning the most effective actions of the states for improving the living conditions of people (Van den Broeck *et al.,* 2016). Despite a lot of the papers which are devoted to housing policy, there is a gap in the scientific literature regarding their estimation in the context of the solution of the housing problem on the national scale. Therefore, the approach of the numerical assessment of the housing policy is presented in the paper. Presented approach is illustrated by cases of the Ukraine and UK.

2. Literature review

Housing is one with most important conditions for human existence (Jiboye, 2011). According to estimates, the significant part of world's population (32%) lives in slums and is demanding improved housing conditions (Arnott, 2008). There are three inequalities which must be considered in housing policy: inequalities of income during life-span (for example in younger and older age), inequalities of opportunities to receive the housing due to social stratification in industrial society (less skill people have lower income and less opportunity to receive a mortgage), inequalities which caused by geographical factor (this factor produces many differences in living conditions in the different regions of the country) (Donnison, 1976).

Additionally, low affordability of the housing has a negative impact on the demographic process. For example, a large part (about 50 percent) of the young people in Taiwan from age group 25 - 40 years live with their parents so as they save on housing costs and this one with main reason low birth rate (0.9 in 2010) in the country (Chen, 2015).

For numerical evaluation of the housing policy**,** the researchers use the separate numerical indicators (Judd and Randolph, 2006; Collinson *et al.,* 2015) or the results of the special survey (Ondola *et al.,* 2013). Researchers focus mainly on low-income groups of the population (Collinson *et al.,* 2015). At the same time, housing policy is a complex system which includes influence on the market environment and the use of non-market tools for a resolving of the housing problem of the widest groups of the population (in ideal it is must suggest resolving the housing problem of all population).

Assessment of the effectiveness of a housing policy is important at least in two aspects. At first, any governments programs and tools must be estimated for the general tendency in the solving of a housing problem in the country. At second, it is important to study and implement the experience and practice of the realization a housing policy of the countries where the housing policy has a high effectiveness. It is impossible without the comparison of the housing policy efficiency in the different countries. So, the main purpose of the given paper is the assessment of housing policy effectiveness in the Ukraine and UK.

3. Results

3.1 Theoretical Pattern for Numerical Assessment of the Housing Policy Efficiency

For quantitative estimation of the government housing policy, the dynamical normative approach (Syroezhin, 1980) has been used. According to this approach, the government housing policy is considered as a complex dynamic system which has the trajectories of the evolution that are characterized by different effectiveness. The trajectory of the most efficiency is defined by hierarchically ordered sets of dynamic indicators (Syroezhin, 1980). Each indicator relates to a certain aspect of the government housing policy. Government housing policy model is presented in Figure 1.

Figure 1. *Levels of the indicators of the government housing policy effectiveness*
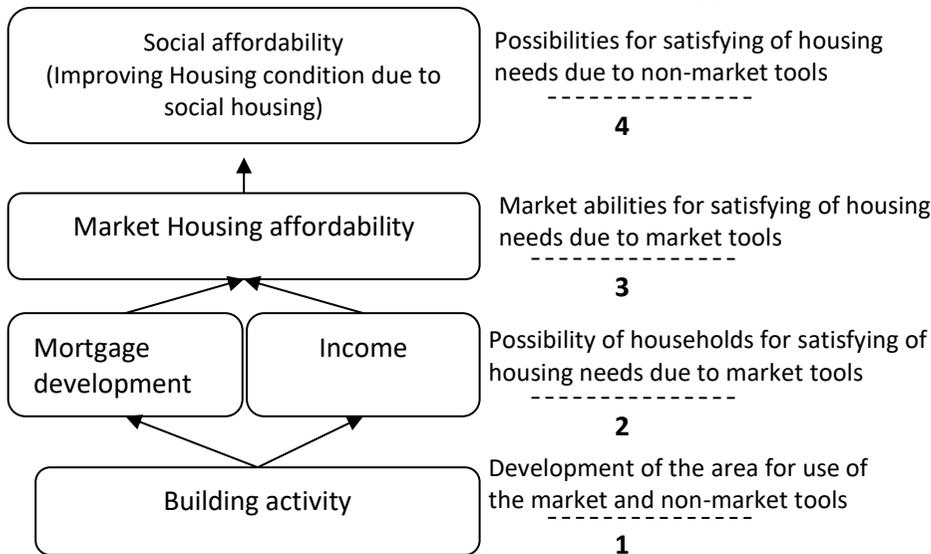
Source: Author.

Presented in Figure 2 reference matrix *{E}* can be used for empirical estimation of the housing policy effectiveness in a certain period. The value *'1'* in the cell with indexes '*ij*' means that elements with a number '*j*' must be larger than elements with a number '*i*'.

Figure 2. *Matrix form of the dynamic indicators hierarchy that corresponds to maximum of the housing policy effectiveness*

	E1	E2.1	E2.2	E3	E4
E1	1	1	1	1	1
E2.1		1		1	1

E2.2			1	1	1
E3				1	1
E4					1

Source: Author.

For diagonal elements, the value *'1'* means that growth rate *(D_i)* for indicator number *i* must be $D_i>100\%$ ($E_{ij}=1$ if $D_j>D_i$). Then the empirical matrix *{Y}* must be filled using the same rule (for above diagonal part) but using the empirical values of the growth rates *DY* of the according to dynamical indicators. In the matrix *{Y}* only cells with value *'1'* in the reference matrix must be filled. Finally, the matrix of the similarities *{S}* is computed according to next rule (1).

$$S_{ij} = \begin{cases} 1 \ if \ E_{ij} = 1 \ and \ Y_{ij} = 1 \\ 0 \ in \ all \ other \ cases \end{cases} \qquad (1)$$

A measure of similarity of empirical matrix *{Y}* to the reference matrix *{E}* can be written as

$$R = \frac{\sum_{i,j=1}^{m} S_{ij}}{N} \cdot 100\% \qquad (2)$$

Where *R* is the measure of a similarity of the arrays *{Y}* and *{E}*, *m*-dimensions of matrix S, *N* are a number of filled cells in the reference matrix. Considering Figure 2 in the given case *N=14*. If *R=100%*, the dynamics of indicators shows full accordance of the politics of housing to reference (ideal) trajectory.

3.2 Justification of the Indicators

The next set of indicators was chosen for in accordance with Figure 1: building activity (1st level), mortgage loans per capita and Income of households (2nd level), affordability of housing (3rd level), and social affordability of housing (4[s] level).

Building activity S1. The high housing deficit is typical for many countries including the UK (Housing supply in 2015-2020, 2015) and Ukraine (Kharchenko, 2013). Most housings in Ukraine was built 40-50 years ago. In the period before privatization of the housing, the government s repair services were slow and ineffective (Roseman, 2003). Such housing is obsolete housing and has low energy efficiency.

Mortgage loans per capita S21.The mortgage is one with most important instruments for purchase of the housing in all developed and developing countries. The mortgage is one with more popular instruments for buying of the housing.

Income of households S22. The income of households is a key indicator of household's ability to purchase any goods including housing (Davies *et al.,* 2010). Housing is very

expensive good, and it cannot be purchased using only current revenues. Even considering of the mortgage, the household must have funds from 50% of the housing price in Ukraine (Kharchenko, 2013) to 20-30% in countries with developed mortgage market (Campbell, 2013).

Affordability of housing S3. Affordability of housing is the indicator of the third level of the hierarchy. Condition $D3_t > D1_t$ means that the housing construction is accelerating and simultaneously the affordability of housing increases more rapidly.

Social affordability of housing S4. A certain number of citizens cannot have housing due to market tools (private rent, buying directly using saving or due to a mortgage) both in developed and developing countries. These groups of citizens are the essential object of housing policy because the governments support such households for the solving of a housing problem. For example, in the UK more 1240 thousand of households were on the waiting list in 2015 (Numbers of households on local authorities housing waiting lists, by district: England 1997-2015, 2016). In Ukraine, more than 650 thousand of households are on the official waiting list (Residential buildings put into service and the number of apartments built, 2016).

3.3 Empirical Assessments: Cases of the UK and Ukraine

The array of empirical data for calculation of matrixes {Y} for Ukraine and UK is reported in Table 1.

**Table 1**. *Empirical dataset for calculation of matrixes DY for Ukraine and UK*

Indicators	Period					
	2010	2011	2012	2013	2014	2015
Ukraine						
S1: number of dwelling per (1000 person)	1.6	1.8	1.9	2.2	2.5	2.8
S21: Mortgage loan per capita, £ 1000	0.20	0.16	0.11	0.10	0.08	0.04
S22: Average annual total resources per one household, GBP	3425	3515	3879	4292	2738	1883
S3: Affordability index	0.37	0.38	0.39	0.35	0.31	0.17
S4: Social affordability index	2.48	2.37	2.24	1.78	1.53	0.00
UK						
S1: number of dwelling per 1000 person	2.44	2.15	2.29	2.07	2.14	2.34
S21: Mortgage loan per capita, £ 1000	19.33	19.25	19.29	19.33	19.51	19.83
S22: Mean equivalised disposable household income, GBP	30953	30725	29667	29713	29945	30716
S3: Affordability index	2.92	2.99	2.98	3.06	2.81	2.92
S4: Social affordability index	14.95	14.75	14.37	13.81	17.99	18.87

Source: *Developed by author according to (House building: Dwellings Completed – Total, 2016; Residential buildings put into service and the number of apartments built, 2016; Loans granted by deposit-taking corporations, 2016; Mortgage lenders and administrators statistics, 2016; XE Currency Charts (UAH/GBP), n.d.; United Kingdom population mid-year estimate,*

2016; State Statistic Service of Ukraine*, n.d; 2016;* Office for National Statistics*, 2015;* Nationwide*, 2016; Property Prices Index., n.d.; Numbers of households on local authorities housing waiting lists, by district: England 1997-2015, 2016; Housing stock, n.d.).*

Following by above approach, the sets of dynamical indicators (*D1*, *D2*, *D3*, *D4*, *D5*) must be calculated for both countries. At the next step, the empirical matrixes of the hierarchy of the dynamical indicators that corresponds to maximum effectiveness of the housing policy were constructed using rules (1) - (2). Figure 3 presents common tendencies in the effectiveness of the housing policies in the UK and Ukraine within period 2011-2015 calculated using formula (2).

Figure 3. *Housing policy effectiveness in the UK and Ukraine within 2011-2015.*
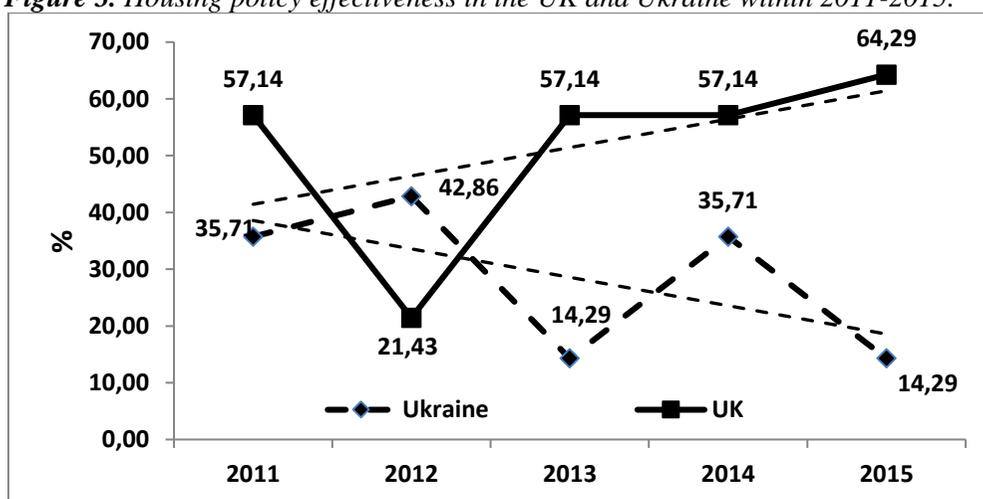
Source: Author.

Figure 3 indicates the higher effectiveness of the state housing policy in the UK in comparison with Ukraine in 2011 and 2013-2015. In this context, two main points must be noted:

1. The effectiveness of housing policy in the UK was higher than in Ukraine within 2011-2015 excluding 2012.
2. The general tendency for the UK is increasing the effectiveness of housing policy whereas, for Ukraine, the decreasing of effectiveness is the main tendency in housing policy. As results, the gap in housing policy effectiveness between Ukraine and UK increased.

The corresponding matrixes of effectiveness of the housing policy for Ukraine and UK in 2015 is presented in Figure 4.

Figure 4: *Empirical matrixes of the hierarchy of the dynamical indicators {Y} that corresponds to maximum effectiveness of the housing politics for Ukraine and UK in 2015.*

Panel A: Ukraine

	0	S1	S21	S22	S3	S4
S1		1	0	0	0	0
S21		0	0	0	1	0
S22		0	0	0	0	0
S3		0	0	0	0	0
S4		0	0	0	0	0

Panel B: UK

	0	S1	S21	S22	S3	S4
S1		1	0	0	0	0
S21		0	1	0	1	1
S22		0	0	1	0	1
S3		0	0	0	1	1
S4		0	0	0	0	1

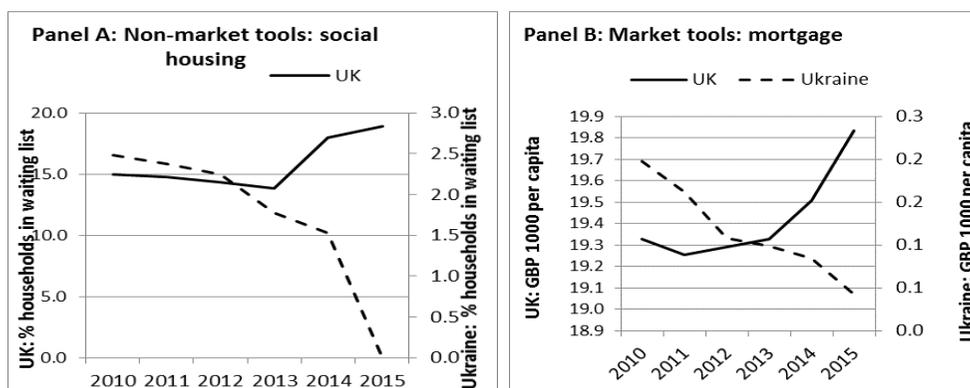**Source:** *Developed by author according to Table 1.*

Panel A in Figure 4 demonstrates only two cells with value 1 whereas the rest of the cells have values 'zero. It indicates the low effectiveness of the housing policy in Ukraine (total number of comparisons is 14 according to Figure 2). So, the total score of the housing policy effectiveness according to formula (2) is $R_{2015}^{Ukr} = \frac{2}{14} \cdot 100\% = 14.29\%$.

The value zero in cells *Y(1,2)*, *Y(1,3)*, *Y(1,4)* and *Y(1,5)* indicates the increasing of the gap between an area for using different tools for a solution to the housing problem and the possibilities to use by citizens of the market and non-market tools to solve housing problems. Only cells *Y(1,1)*, *Y(2,3)* have the values '1' indicating the increase of the building activity (*Y(1,1))* and the fact, that mortgage per capita decreases more strongly than housing affordability. This demonstrates that gaps between levels of housing policy increased excluding except the gap between mortgage and housing affordability.

In the case of the UK, 10 cells have value 1 (Panel B in Figure 4). So, the total score of the housing policy effectiveness in the UK in 2015 is $R_{2015}^{Ukr} = \frac{10}{14} \cdot 100\% = 14.29\%$. All diagonal elements have a value '*1*'. It indicates a positive dynamic of all levels presented in Figure 2. So, the main differences in housing policy effectiveness between Ukraine and UK concern the developing of the mechanisms for transferring the new housing to people using both market and non-market tools (Figure 5).

Panel A of Figure 5 shows the social affordability of housing in Ukraine is lower significantly than in the UK. The difference between countries in 2014 was near 12 times. So, the households in the UK have a lot more possibilities to improve their housing condition due to non-market tools than in Ukraine. So, there is a large difference in possibilities of the use non-market tools for satisfying of the housing need between UK and Ukraine. As Figure 5 (Panel B), the mortgage loans value per capita in Ukraine is less than in the UK in 60 times in 2015.

Figure 5: *Tendencies in the use of the market and non-market tools for solving the housing problem in Ukraine and UK.*

Source: *Developed by author according to Table 1.*

Additionally, approximately only 50% mortgage is used for buying of the housing in Ukraine (Ukrainian national mortgage association, 2012). The value of mortgage loans per capita in the UK grows from 2011 whereas the given indicator demonstrates opposite trend in Ukraine from 2010. So, Ukrainian citizen has much fewer possibilities to use mortgage for buying housing in comparison to UK citizen. Panel A indicates that social affordability of housing in Ukraine decreases drastically in 2015. The main reason for this is very limited resources of government and absence of tools to rent of housing. The government passes new housing in the ownership. The social rent is absent in Ukraine. Any citizen, which received housing constructed by government support, stay its owner even he (she) will receive a high-income in the future. In the UK, the social housing has near 25% of total housing market value and includes public and private rental housing units (Stone, 2003).

4. Conclusions and Suggestion for Future Research

The presented in the given article approach allows receiving a quantitative estimate of the government housing policy effectiveness using the hierarchical set of macroeconomic indicators. Basing on the given approach it was found that housing policy effectiveness in Ukraine had a value 14.29% in 2015. The effectiveness of housing policy in the UK is much higher in comparison to Ukraine – 64.29% in 2015. The effectiveness of housing policy in the UK has a positive tendency within 2011-2015 (especially in 2013-2015).

The opposite trend was observed for Ukraine where the effectiveness of the housing policy decreased from 42.86% in 2012 to 14.29% in 2015.In 2015, Ukraine had negative tendencies at all levels of indicators of the effectiveness of housing policy excluding building activity. Additionally, the gaps between all levels increased excluding difference in the dynamic of the mortgage loans and housing affordability. The main problem in case of Ukraine is that positive tendency in building activity

does not reflect in the solution of the housing problem of neediest people. All market and non-market government's tool support the housing ownership. So, social rent and market of the social housing are absent in both public and private sectors. Therefore, Ukrainian's government needed the study and implementation the tools of transfer of the new housing for social rent. More detail these tools and the possibility for implementation it in Ukraine must be estimated in the future studies.

Only public statistical information was used for estimation of the housing policy effectiveness. The assessment may be supplemented by survey results. The special questionnaire must be developed for this purpose and received results may be used in the future studies.

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