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ECONOMIC MODELLING: DEFINITION, EVALUATION AND TRENDS (A SHORT THEORETICAL REVIEW)

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Abstract

This paper introduces a definition, evaluation and trends of economic modelling from a theoretical and technical perspective. Hence, this research is taking such as main bibliographical source the economic modelling (EM) journal that offer to us different research focuses, methods, methodologies, techniques in the last twenty seven years (1984-2011) about economic modelling. Basically, the main objective of this paper is to evaluate and analyze the trends of economic modelling according to our forty (40) variables that were proposed on this paper.

JEL Classification: E65

Keywords: Economic modelling, economics teaching

1. Introduction

This paper makes several observations and recommendations pertaining to economic modelling. First, it introduces a definition of economic modelling together with a way to classify economic modelling. Based on a careful study of the total of 1480 research papers published by the Economic Modelling (EM) journal between 1984 and 2011, it presents the percentages of papers published in individual categories of economic modelling identified. Second, based on an observation of the common approaches used in economic modelling papers in the past 28 years in (EM) journal, this paper recommends multidisciplinary approach to economic modelling. It suggests the incorporation of multidisciplinary, non-economic variables in policy modelling to formulate strong policies.

2. Definition and Classification of Economic Modelling

“Economic modelling” can be defined as “an academic research work, that is supported by the use of different theories as well as quantitative or qualitative models and techniques, to

analytically evaluate the causes and effects of any economic phenomenon that affect on society, anywhere and anytime.” As an integral part of this definition, “policy” is defined as “a theoretical or technical instrument that is formulated to solve specific problems affecting, directly or indirectly, societies across different periods of times and geographical spaces.” (Ruiz Estrada, 2011)

Economic modelling can also be classified. Based on a study of all the one thousand four hundred eighty (1480) papers that were published in the Economic Modelling (EM) journal from 1984 to 2011 (27 years) (see Table 1 and Figure 1), economic modelling can be classified into the following twelve (12) categories: (i) domestic and international trade modelling; (ii) energy, communications and transportation modelling; (iii) environmental and natural resources management modelling; (iv) fiscal policy modelling; (v) institutional, regulation and negotiation modelling; (vi) labor, income, employment and population modelling; (vii) monetary, banking and investment policy modelling; (viii) production, prices and consumption modelling; (ix) technological and R&D modelling; (x) welfare economics modelling; (xi) economic growth modelling; (xii) miscellaneous economic modelling.

Based on the same study and the same classification above, the percentages of papers in the individual categories of policy modelling were found to be as follows: (i) domestic and international trade modelling (15 papers = 1%); (ii) energy, communications and transportation modelling (15 papers = 1%); (iii) environmental and natural resources management modelling (74 papers = 5%); (iv) fiscal policy modelling (252 papers = 17%); (v) institutional, regulation and negotiation modelling (0 papers = 0 %); (vi) labor, income, employment and population modelling (44 papers = 3%); (vii) monetary, banking and investment modelling (266 papers = 18%); (viii) production, prices and consumption modelling (311 papers = 21%); (ix)

technological and R&D economic modelling (74 papers = 5%); (x) welfare economics modelling (15 papers = 1%); (xi) economic growth modelling (400 papers = 27%); (xii) miscellaneous economic modelling (15 papers = 1%).

[Insert Table 1 and Figure 1 here]

[Insert Table 2 and Figure 2 here]

3. Multidisciplinary Approach

Among the 1480 papers published in (EM) journal in the past 27 years (1984-2011), the following research orientation was common: benefit/cost, probabilistic or forecasting analysis through the application of econometric methods and use of microeconomic and macroeconomic levels secondary data. Also, among these 1480 papers, and for the past 27 years, there has been an increasing dependency on econometrics models, methods and techniques. Ninety seven percent (99%) or 1465 of these papers adopted the economics research approach. Only 1% or 15 of these papers adopted a multidisciplinary approach (entailing several disciplines such as history, economics, sociology, politics, technology and social sciences et cetera).

This paper is of the view that the absence of non-economic variables can considerably increase the vulnerability of any economic modelling. Therefore, it suggests that any economic modelling should take into consideration a wide range of factors, including unforeseen factors. These factors include, among others, natural disaster trends, climate changes, terrorism, crime and violence, poverty expansion, religion and beliefs, education system, social events and phenomena, social norms and behavior, et cetera. This paper maintains that it is necessary to incorporate these sorts of factors in economic modelling in order to formulate strong policies of minimal vulnerability possible. However, it must be assumed that all these factors maintain a

constant quantitative and qualitative transformation(s) in different historical periods of the society concerned (Ruiz Estrada, 2011).

Moreover, this paper makes a deep analysis about economic modelling evolution. We are taking in account a careful study of a total of 1480 papers. It presents the percentages of papers published in individual categories of economic modelling identified by Ruiz Estrada. Additionally, we are going to study the common modelling approaches used in different papers at the last twenty seven years in economic modelling (EM) journal. At the same time, this paper recommends multidisciplinary approach to economic modelling. It suggests the incorporation of multidisciplinary, non-economic variables in economic modelling to formulate strong policies. Secondly, the evolution of the economic modelling (EM) journal is possible to observe through different volumes from year 1984 until year 2011 that the application of different research approaches into economic modelling keeps a constant quantitative transformation (volume of research output) and a qualitative transformation (content and form). Especially, these quantitative and qualitative transformations can be observed in different manuscripts in this specific journal by the application of different quantitative and qualitative methods, innovative policies and recommendations.

4. The Economic Modeling Trend

Among the 1480 papers published in economic modelling (EM) journal in the past twenty eight years (1984-2011), the following research orientation was common: benefit/cost, probabilistic or forecasting analysis through the application of econometric methods and use of microeconomic and macroeconomic levels secondary data. Therefore, we are using forty (40) variables to evaluate all papers were published by the economic modelling (EM) journal until today. The following forty (40) variables are (1.) predicting economic modelling; (2.)

monitoring economic modelling; (3.) simulation economic modelling; (4.) empirical economic modelling; (5.) theoretical economic modelling; (6.) primary data economic modelling; (7.) secondary data economic modelling; (8.) long run economic modelling; (9.) short run economic modelling; (10.) linear regression analysis; (11.) multiple regression analysis; (12.) times series data analysis; (13.) cross-sectional data analysis; (14.) panel data analysis; (15.) 2-Dimensional graphical modelling; (16.) 3-Dimensional graphical modelling; (17.) economics policy modelling approach; (18.) technological policy modelling; (19.) environment policy modelling; (20.) original theoretical framework; (21.) traditional theoretical framework; (22.) extension theoretical framework; (23.) private sector modelling; (24.) public sector modelling; (25.) macroeconomics modelling; (26.) microeconomics modelling; (27.) partial equilibrium modelling; (28.) general equilibrium modelling; (29.) dynamic economic modelling; (30.) static economic modelling; (31.) perfect competition modelling; (32.) imperfect competition modelling; (33.) national level modelling; (34.) regional level modelling; (35.) global level modelling; (36.) Keynesian modelling approach; (37.) monetary modelling approach; (38.) classic economic modelling approach; (39.) neo-classic economic modelling approach; (40.) planning economic modelling approach. (see Table 3). Based on the same study and the same classification of variables above, the percentages of papers in the individual modelling approaches in the economic modelling (EM) journals was found to be as follows: (1.) predicting economic modelling (1214 papers = 82%); (2.) monitoring economic modelling (118 papers = 8%); (3.) simulation economic modelling (148 papers = 10%); (4.) empirical economic modelling (1110 papers = 75%); (5.) theoretical economic modelling (370 papers = 25%); (6.) primary data economic modelling (15 papers = 1%); (7.) secondary data economic modelling (1465 papers = 99%); (8.) long run economic modelling (1406 papers = 95%); (9.) short run

economic modelling (74 papers = 5%) ; (10.) linear regression analysis (74 papers = 5%); (11.) multiple regression analysis (252 papers = 17%); (12.) times series data analysis (340 papers = 23%); (13.) cross-sectional data analysis (474 papers = 32%); (14.) panel data analysis (340 papers = 23%); (15.) 2-Dimensional graphical modelling (1465 papers = 99%); (16.) 3-Dimensional graphical modelling (15 papers = 1%); (17.) economics policy modelling (1450 papers = 98%); (18.) technological policy modelling (15 papers = 1%); (19.) environment policy modelling (15 papers = 1%); (20.) original theoretical framework (15 papers = 1%); (21.) traditional theoretical framework (1362 papers = 92%); (22.) extension theoretical framework (104 papers = 7%); (23.) private sector modelling (0 papers = 0%); (24.) public sector modelling (1480 papers = 100%); (25.) macroeconomics modelling (1450 papers = 98%); (26.) microeconomics modelling (30 papers = 2%); (27.) partial equilibrium modelling (148 papers = 10%); (28.) general equilibrium modelling (1332 papers = 90%); (29.) dynamic economic modelling (1332 papers = 90%); (30.) static economic modelling (148 papers = 10%); (31.) perfect competition modelling (74 papers = 5%); (32.) imperfect competition modelling (1406 papers = 95%); (33.) national level modelling (1362 papers = 92%); (34.) regional level modelling (44 papers = 3%); (35.) global level modelling (74 papers = 5%); (36.) Keynesian modelling approach (400 papers = 27%); (37.) monetary modelling approach (636 papers = 43%); (38.) classic economic modelling approach (148 papers = 10%); (39.) neo-classic economic modelling approach (281 papers = 19%); (40.) planning economic modelling approach (15 papers = 1%). (see Table 3).

Moreover, it is possible to observe in the economic modelling (EM) journal almost all papers are focused on predicting economic modelling (82%) and empirical economic modelling (75%) according to our final results. In the case of data analysis modelling 99% of these papers are

used secondary data economic modelling from different bibliographic and statistical sources. In the case of time framework in the data analysis modelling all these papers are based on the long run economic modelling (95%) and short run economic modelling (5%). Usually, the econometric approaches apply by different authors in the economic modeling (EM) journal is following by the uses of cross-sectional data analysis (32%), time series data analysis (23%) and panel data analysis (23%) respectively. In fact, the research approaches are used by the economic modelling (EM) journal all his papers are focused on economic policy modeling (98%) and in less amounts in technological policy modeling (1%) and others (1%). Another interesting result in this research paper is that 92% of the papers were published in the economic modeling (EM) journal. These papers are based on the uses of the traditional theoretical framework and only 1% of all these papers are based on an original theoretical framework. Additionally, 100% of economic modelling (EM) journal papers are oriented to the public sector modelling. In the case of analysis under macroeconomics and microeconomics modelling levels are possible to be observed a distribution of 98% and 2% respectively. In addition, the economic modelling (EM) journal papers are supported by the general equilibrium economic modelling (90%), static policy economic modelling (10%) and imperfect competition modelling (95%). In the case of geographical coverage of research by economic modelling (EM) journal papers are distributed by national level modelling (92%) and global level modelling by (5%). Moreover, the most common economic theoretical framework is used by the economic modelling (EM) journal papers is followed by Keynesian modelling approach (27%), monetary modelling approach (43%), neo-classic economic modelling approach (19%) and classic economic modelling approach (10%). Finally, in the type of graphical modelling is applied by economic modelling (EM) journal papers are based on the common use of 2-dimensional

graphical modelling (99%) and only 1% applied 3-dimensional graphical modelling (see Table 3).

[INSERT TABLE 3]

4. The Future of Economic Modelling:

According to this paper the economic modelling can show a great future for social scientists. Hence, the economic modelling can be considered as an alternative flexible and dynamic research field that is available to adapt the uses of any research technique, method, methodology and research focus. According to our research economic modelling can be considered as a multi-discipline research approach that can facilitate the study of different socio-economic-political problems that can impact negatively on the society anywhere and anytime.

However, we can say that economic modelling became an important technical-theoretical analytical tool for future academics, economists, policy makers and supranational institutions such as World Bank (WB), United Nations (UN) and others. On another hand, the fast expansion of the economic modelling can be observed by the fast growth of his impact factor of economic modelling journal just recently got 0.601 in the year 2011 according Thomson Reuters report.

5. Conclusion

This paper conclude that economic modelling can open a new research field to academics, policy makers and social scientist in the study of complex and dynamic behavior of socio-political-economic problems that can affect our society anytime and anywhere without borders. Finally, the economic modelling can became more powerful analytical tool if different authors adapt new techniques, methodologies, methods and research approaches from sociology,

political sciences, technology, environment, sciences to explain more deeply dynamic and complex socio-political-economic phenomenon that affect different social groups in the society at different geographical areas under different periods of time.

6. *References*

Elsevier (2011). Economic Modelling (EM) Journal.

<http://www.sciencedirect.com/science/journal/01618938> (accessed January 15, 2011)

Ruiz Estrada, M. (2011). Policy Modeling: Definition, Classification and Evaluation. *Journal of Policy Modeling*, 33(4): 1015-1029.

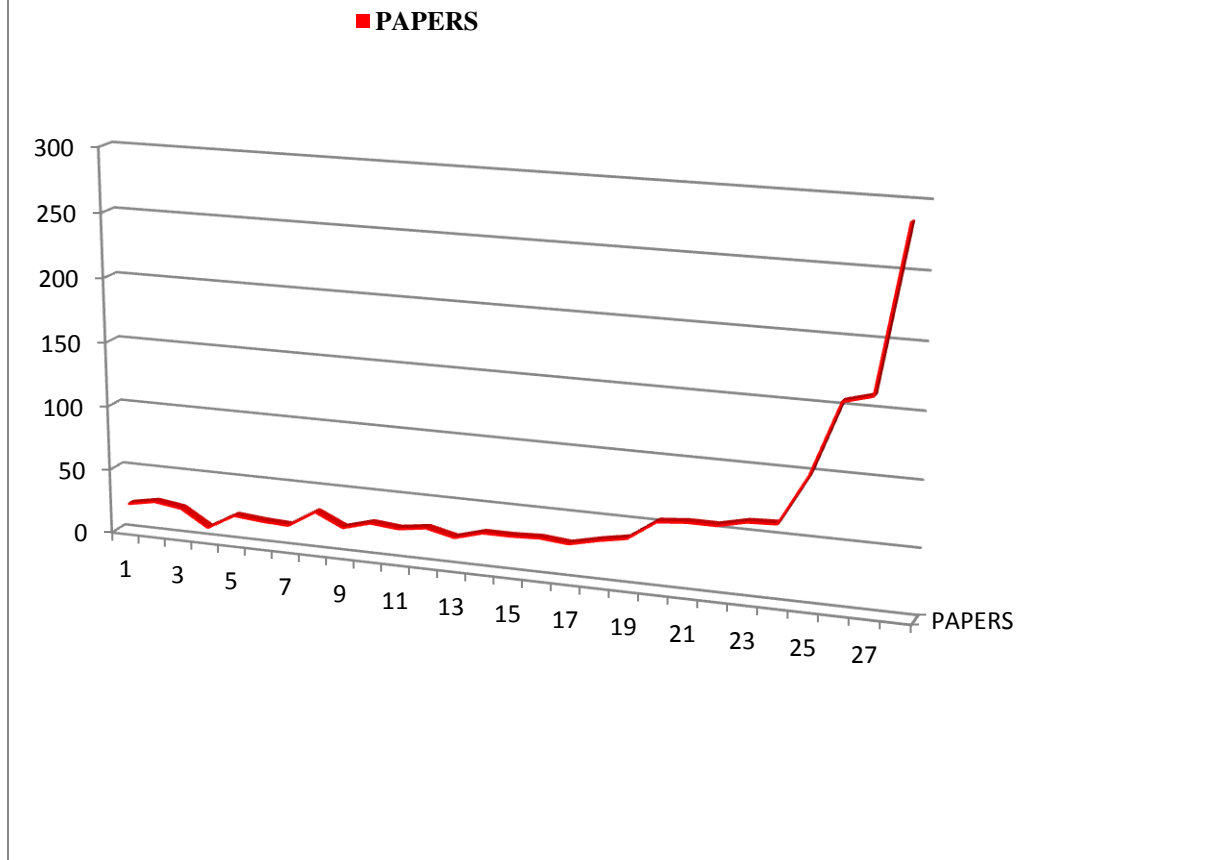
Table 1: Total Papers Output from Economic Modelling by Volume and Issues (1984-2011)

VOL	YEAR	Issues									PAPERS
		I-1	I-2	I-3	I-4	I-5	I-6	I-7	I-8	I-9	
1	1984	8	5	4	5	0	0	0	0	0	22
2	1985	12	5	1	8	0	0	0	0	0	26
3	1986	6	8	5	4	0	0	0	0	0	23
4	1987	1	1	5	3	0	0	0	0	0	10
5	1988	8	4	4	6	0	0	0	0	0	22
6	1989	5	6	1	8	0	0	0	0	0	20
7	1990	3	6	6	4	0	0	0	0	0	19
8	1991	10	5	10	7	0	0	0	0	0	32
9	1992	4	7	4	7	0	0	0	0	0	22
10	1993	8	6	8	6	0	0	0	0	0	28
11	1994	5	11	7	3	0	0	0	0	0	26
12	1995	7	8	7	7	0	0	0	0	0	29
13	1996	6	5	6	7	0	0	0	0	0	24
14	1997	7	9	6	8	0	0	0	0	0	30
15	1998	8	6	10	6	0	0	0	0	0	30
16	1999	7	8	8	8	0	0	0	0	0	31
17	2000	8	6	7	8	0	0	0	0	0	29
18	2001	8	10	8	8	0	0	0	0	0	34
19	2002	9	7	8	7	7	0	0	0	0	38
20	2003	10	9	11	10	6	7	0	0	0	53
21	2004	8	9	11	7	7	13	0	0	0	55
22	2005	11	7	10	9	10	8	0	0	0	55
23	2006	10	9	11	11	9	10	0	0	0	60
24	2007	11	10	11	9	7	13	0	0	0	61
25	2008	14	14	15	14	23	19	0	0	0	99
26	2009	28	31	21	7	36	32	0	0	0	155
27	2010	52	13	18	10	47	21	0	0	0	161
28	2011	38	40	74	66	28	40	0	0	0	286
	Total by Issue	312	265	297	263	180	163	0	0	0	1480

Source: Economic Modelling (EM) Journal (2011)

<http://www.sciencedirect.com/science/journal/02649993>

Figure 1: Total Papers Output from Economic Modelling by Volume and Issues



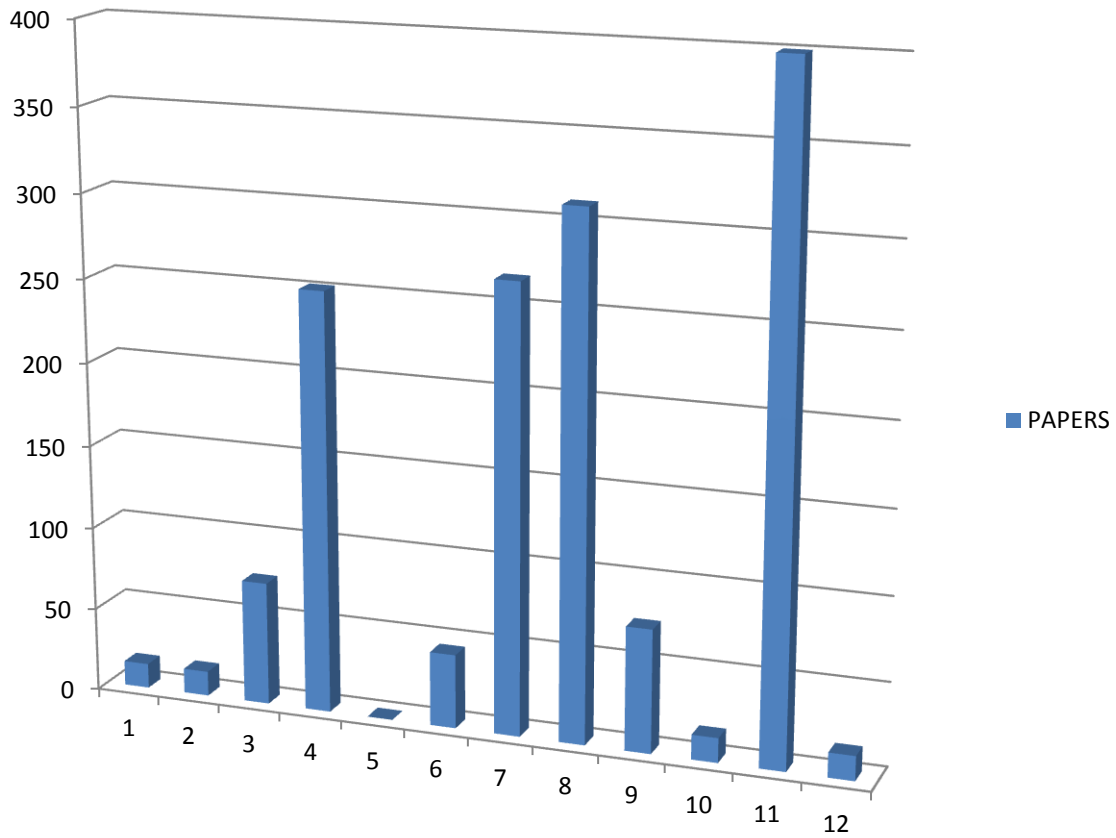
Source: Economic Modelling (EM) Journal (2011)
<http://www.sciencedirect.com/science/journal/02649993>

Table 2: Classification and Distribution of Economic Modelling Papers by 12 Categories (1984-2011)

	CLASSIFICATION	PAPERS	%
1	The Domestic and International Trade Modelling	15	1%
2	Energy, Communications and Transportation Modelling	15	1%
3	Environmental and Natural Resources Management Modelling	74	5%
4	Fiscal Policy Modelling	252	17%
5	Institutional, Regulation and Negotiation Modelling	0	0%
6	Labor, Education, Income, Employment and Population Modelling	44	3%
7	Monetary, Banking and Investment Policy Modelling	266	18%
8	Production, Prices and Consumption Modelling	311	21%
9	Technological and R&D Modelling	74	5%
10	Welfare Economics Modelling	15	1%
11	Economic Growth Modelling	400	27%
12	Miscellaneous Economic Modeling	15	1%
Total		1480	100%

Source: Economic Modelling (EM) Journal (2011)
<http://www.sciencedirect.com/science/journal/02649993>

Figure 2: Classification and Distribution of Economic Modelling Papers by 12 Categories (1984-2011)



Source: Economic Modelling (EM) Journal (2011)
<http://www.sciencedirect.com/science/journal/02649993>

Table 3: Evaluation of the Economic Modelling Journal (40 Variables)

No.	Modeling Approach	Total	%
1	Predicting economic modelling	1214	82%
2	Monitoring economic modeling	118	8%
3	Simulation economic modelling	148	10%
	Total	1480	100%
4	Empirical economic modelling	1110	75%
5	Theoretical economic modelling	370	25%
	Total	1480	100%
6	Primary data economic modelling	15	1%
7	Secondary data economic modelling	1465	99%
	Total	1480	100%
8	Long run economic modelling	1406	95%
9	Short run economic modelling	74	5%
	Total	1480	100%
10	Linear regression analysis	74	5%
11	Multiple regression analysis	252	17%
12	Times series data analysis	340	23%
13	Cross-sectional data analysis	474	32%
14	Panel data analysis	340	23%
	Total	1480	100%
15	2-Dimensional graphical modelling	1465	99%
16	3-Dimensional graphical modelling	15	1%
	Total	1480	100%
17	Economics policy modelling	1450	98%
18	Technological policy modelling	15	1%
19	Environment policy modelling	15	1%
	Total	1480	100%
20	Original theoretical framework	15	1%
21	Traditional theoretical framework	1362	92%
22	Extension theoretical framework	104	7%
	Total	1480	100%
23	Private sector modelling	0	0%
24	Public sector modelling	1480	100%
	Total	1480	100%

Source: Economic Modelling (EM) Journal (2011)

<http://www.sciencedirect.com/science/journal/02649993>

Table 3: Evaluation of the Economic Modelling Journal (40 Variables)

25	Macroeconomics modelling	1450	98%
26	Microeconomics modelling	30	2%
	Total	1480	100%
27	Partial equilibrium modelling	148	10%
28	General equilibrium modelling	1332	90%
	Total	1480	100%
29	Dynamic economic modelling	1332	90%
30	Static economic modelling	148	10%
	Total	1480	100%
31	Perfect competition modelling	74	5%
32	Imperfect competition modelling	1406	95%
	Total	1480	100%
33	National level modelling	1362	92%
34	Regional level modelling	44	3%
35	Global level modelling	74	5%
	Total	1480	100%
36	Keynesian modelling approach	400	27%
37	Monetary modelling approach	636	43%
38	Classic economic modelling approach	148	10%
39	Neo-Classic economic modelling approach	281	19%
40	Planning Economy Modelling Approach	15	1%
	Total	1480	100%

Source: Economic Modelling (EM) Journal (2011)
<http://www.sciencedirect.com/science/journal/02649993>