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The Expansion Input - Output Tables

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I. Introduction

The Input – output extension are one of the useful tools of economic research. The matrixes can be used for policy analysis and economic planning, and offers an efficient means of summarizing complex economic relationships and identifying gaps in statistical information.

In the past decades, there has been a noticeable shift of interest from the basic input-output table to the social account matrix (SAM) as evident from the increased momentum in the design, construction and use of social accounting matrices in many countries (Piatt and Roe, 1997; Cohen et al., 1984; Pyatt and Round, 1985). The argument in favor of working with SAM or extended input-output models is the increasingly prevalent requirement by policy – makers and the larger public alike appraise.

Social accounting matrices are compiled according to the same accounting principles used for input-output table; each transaction is recorded twice so that any inflow to one account must be balanced by an outflow of another account. The extension of input-output table based on linking the location of production account and the location income and consumption of institutional as household, Government and enterprise.

Another way, the Miyazawa's concept of the interrelation income multiplier was designed to analyze the structure of income distribution by endogenous consumption demand in the standard Leontief model; these ideas were also incorporated in the familiar social account systems developed by Stone (1961), Pyatt and Roe (1997), and in the parallel developments of demographic-economic modeling associated with Batey and Madden (1983); In order to linkage the concept on interregional input output modeling and demographic – economic modeling may be considered the function system.

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II. Social Accounting Matrix

Being an extension of the existing national economic accounts, a SAM is a consistent and complete representation of the socio-economic system that captures the interdependencies of institutional groups. It is both a conceptual framework and a data system that can support analyses of socio-economic policy issues, used to evaluate the socio-economic impact of exogenous changes, or serve as a database for general equilibrium modeling.

III. Updating Input-Output Table

An input-output table describes the flows among the various sectors of the economy. It represents the value of economic transactions in a given period of time. Transactions of goods and services are broken down by intermediate and final use. An input-output table also shows the cost structure of production activities: intermediate inputs, compensation to labor and capital, taxes on production.

The SAM can be extended by input-output framework or supply and use tables. The first of all we have to compile or update a input-output table (or supply and use tables). The Leontief system was described by equations as follows:

$$A.X+Y=X \qquad 1$$
$$X= (I-A)^{-1}.Y \qquad 2$$
$$Y = C + G + I + E - M \qquad 3$$
$$M_i/TDD_i<1 \qquad 4$$
$$TDD_i = IC_i + C_i + G_i + I_i \qquad 5$$
$$\Delta X = (I - A)^{-1}.\Delta Y \qquad 6$$

Where A is the direct input coefficient matrix
X is vector of supply or sectoral output
Y is vector of final demand
$(I - A)^{-1}$ is the Leontief Inverse, or matrix of multipliers
C is final consumption of household
G is final consumption of government
I is gross fixed capital or capital formation
E is export
M is import

M_i is import of commodity i
TDD_i is total domestic demand of commodity i

From these basic relations of the I/O table, the following formulas were derived with formula (7) take into account the three changes in X, namely price changes, technical changes and changes in Y (final demand) through the years. Given the structure of the National's economy and the relatively short time break from the last updating of input-output table which was for the year t_1, formula (8) was used to calculate the technical coefficient matrix A for the updated year t_2 I/O table, which assumes that there was no or small change in prices and technical change

$$x_{ij}^{t2} = \left(\frac{x_{ij}^{t1}}{II_j^{2003}} \right) \cdot II_j^{t1} \qquad (7)$$

$$x_{ij}^{t2} = \left(\frac{x_{ij}^{t1}}{GI_j^{2003}} \right) \cdot GI_j^{t1} \qquad (8)$$

$$va_{kj}^{t2} = \left(\frac{va_{kj}^{t1}}{VA_j^{2003}} \right) \cdot VA_J^{t1} \qquad (9)$$

Where

x_{ij}^{t2} is the amount of the product of sector i absorbed – as its input – by sector j in year t2

x_{ij}^{t2} is the amount of the product of sector i absorbed – as its input – by sector j in year t2

II_j^{t1} is an element of the vector II in 2003 or the total intermediate input in year t1

II_j^{t2} is an element of the vector II in year t2

va_{kj}^{t2} is an element of the value added matrix in year t2, where k is factor of value added at factor cost

va_{kj}^{t1} is an element of the value added matrix in year t1, where k is factor of value added at factor cost

VA_j^{t1} is an element of the vector value added in year t1

VA_J^{t2} is an element of the vector value added in year t2

These formulas were used to compute the technical coefficient matrix A and therefore the intermediate demand matrix of the input-output table and the value added matrix, which is broken-down into payments to labor and capital, depreciation, and indirect taxes.

As stated above, equation (8) was used with an assumption that technological change and the change in prices have not occurred during the last years. One issue with the vector GI is of course the property of this vector since it is an(1x industry)vector.

Therefore this must be recalculated to get a (1x Commodity) vector. This could be done with the data from the last input-output table or S.U.T as follows:

From last I/O or S.U.T, the supply matrix S is taken out. This is an industry-by-commodity matrix With a simple formula presented below, the commodity-by-commodity GI vector can be calculated

$$GI_{t2}^{c} = s'.GI_{t2}^{a} \qquad (10)$$

Where

GI_{t2}^{c} is vector of gross input by commodity of the year t2

GI_{t2}^{a} is column vector of gross input by industry of the year t2

s is coefficient matrix of S with dimension (industry x product)

s' is transpose of s with dimension (product x industry)

The use matrix of the S.U.T can be used to get the use matrix of the year t2:

$$U_{t2} = U_{t1}.GI_{t2}^{a} \qquad (11)$$

With

U_{2003} is coefficient matrix of use table in year t1

U_{2005} is coefficient matrix of use table in year t2

From the above formulas, now the A matrix of I/O in year t2 can be computed using the following formula:

$$A = U_{t2}.s^{-1} \qquad (12)$$

With s^{-1} is an inverse of matrix s (commodity technology assumption)

But while coming at matrix A, one problem arose. Some elements of this matrix is negative and thus should be corrected by changing it to 0. Further, to balance the I/O table, we use RAS method.

The value added matrix and the final demand matrix is left to be computed. The value added matrix can be calculated from the formula:

$$B = A.GI_{t2}^{c} \qquad (13)$$

where B is the matrix containing both the A matrix and the value added matrix

The final demand or the Y was computed using equation (3).

IV. Competitive and Non-Competitive I/O Tables

a) Competitive I/O table:

In the competitive I/O table the intermediate inputs include both commodities produced domestically and imported.

b) Non-competitive I/O table:

In this kind of I/O tables, the intermediate inputs are broken-down into commodities produced domestically and commodities imported from the rest of the world.

For the purpose of analyzing the economy based on the I/O table, the competitive table is not of much use for the reasons stated above; the competitive table does not separate the intermediate inputs which are produced by domestic industries from the imported intermediate inputs. Thus the precision and the usefulness of the analysis based on the competitive table is a matter for arguing.

Meanwhile a non-competitive table with import clearly separated from intermediate inputs produced domestically and thus with two intermediate input coefficient matrix A^d (domestic A) and A^m (import A) will give the users a much better picture of the economy.

Following is the indirect method of how to come from the competitive I/O table at a non-competitive I/O table.

Coming from the basic relations of the I/O table with equations from (1) to (6), we take the equations (4) and (5) to compute the ratio of imported goods in Total domestic demand. From this structure of imported goods in domestic demand, the intermediate input matrix can easily be achieved. The value added matrix of non-competitive table remains the same as in the competitive table. In the final demand matrix, all the elements are different except for the export vector.

V. SAM Building

In this section, the construction of the SAM will be discussed greatly in detail. Constructing a SAM table is a rather complicated issue and requires deep knowledge of the SNA, the input-output table, supply and use tables as well as different updating and balancing methods namely the RAS method, not least the knowledge on the performance of the National's economy

The Social Accounts track the monetary flows between industries and institutions. The relation between a SAM and an I/O table is the fact that the input-output accounts are a subset of the entire social accounts recorded in a country. The social accounts track all monetary flows, both market and non-market. The market flows are those between producers of goods and services and consumers, both industrial, and non-industrial (i.e households, government, investment, and trade). The non-market flows are those between households and government, government and households, capital and households and so on. These flows are often called inter-institutional transfers.

A classical and very simple aggregate version of SAM is introduced in the table below:

Table 1 : SAM Framework expansion from S.U.T (Supply and Use tables).

	(1) Industry	(2) Commodity	(3) Factors	(4) Institutions	(5) ROW
1-Industry		Make matrix			1x5
2-Commodity	Use matrix			xxxxxxx	
3-Factors	xxxxxxx				
4-Institutions		4x2	4x3	4x4	4x5
5-ROW	5x1		5x3	5x4	5x5

Each cell represents a sub-matrix. Rows represent an institutional or industry receipt of income. Columns represent an institutional or industry payment or expenditure. In a SAM table, rows and columns balance exactly so all flows are counted.

Following is the explanation of the data contained in each cell of the above example of an aggregated SAM.

1. Industry is the industry sectors from the I/O table
2. Commodity is the commodities also from the I/O table
3. Factors include the value-added elements:
   - Types of Labor incomes (L)
   - Type of capital incomes (K)
4. Institutions include
   - Households
   - Government
   - Enterprises (basically consists of corporate profits)
   - Capital
   - Inventory

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5. ROW
   - imports
   - exports

Again, the building of SAM extended by input-output system requires a certain source of data, namely:

1. Data of Intermediate Inputs and Gross Inputs
2. S.U.T in year t_1
3. Export and Import of goods and services
4. Balance of Payment
5. State budget
6. Updated non-competitive I/O in year t_2

The detailed elements of the SAM extended by input-output system are in the following table.

Table 2 : SAM expansion from I/O table.

	(1) Commodity	(2) Factors	(3) Institutions	(4) I-S	(5) ROW
1-Commodity	1x1	1x2			1x5
2-Factors	2x1			2x4	
3- Institutions	3x1				
4-Saving		4x2	4x3	4x4	4x5
5-ROW	5x1		5x3	5x4	5x5

From table 2 can convert to table 3 can apply a paper of Bui Trinh, Kiyoshi Kobayashi and Kwang Moon Kim (2012).

VI. Demographic – Economic Modeling

Miyazawa expanded I/O model into a demographic model - economic modeling and this model has been completed by Batey and Madden (1983). The model introduces the concept of Leontief inverse matrix and expand Leontief extended system for Keynes multipliers, which can analyze the relationship between income groups and consumer groups, respectively. The model is also used to analyze the structure of income in order to describe quantitatively the relationship between income from production and income not from production. In which case, it is classified according to the system of national accounts published by the United Nations (UN "System of National Accounts - SNA", 1993), non-production income includes income from property and income from transfer.

Demographic - Economic model is created by Miyazawa (1966), it's a similar form to the Social Accounting Matrix, in order to describe the distribution and redistribution of the economy. Essentially, the Demographic – Economic model and the Social Accounting Matrix are similar and it could easily be changed from one model to another depending on other study purposes. In this study, Demographic – Economic model is developed in institutional regions (households, other type of enterprise, State region is divided by type of tax). These institutional regions are considered as endogenous variables: saving and relations with foreign countries are considered as exogenous variables. This model is a combination between the notion of inter-regional I/O model and demographic - economic model, as presented in matrix form below:

$$P=AP+F=(I-A)^{-1}F \qquad (14)$$

The SAM can be used similarly, note that the matrix, A is not only descries production account but also descries re-distribution from property and transfer; the vector of row total, x, represents the endogenous variables, whereas the vector f represents the exogenous variables. The vector of endogenous variables, x, can be solved in equation (15):

$$x = Af + x = (I-A)^{-1}x = Mx \qquad (15)$$

Where,

M is the aggregate multiplier matrix.

Another way, the Miyazawa's concept of the interrelation income multiplier was designed to analyze the structure of income distribution by endogenous consumption demand in the standard Leontief model; these ideas were also incorporated in the familiar social account systems developed by Stone (1961), Pyatt and Roe (1997), and in the parallel developments of demographic-economic modeling associated with Batey and Madden (1983); In order to linkage the concept on interregional input output modeling and demographic – economic modeling may be considered the following system:

$$\begin{bmatrix} A & c_1 & g_1 & 0 \\ h & 0 & g_2 & e_1 \\ g & c_2 & 0 & e_2 \\ e & c_3 & g_3 & e_3 \end{bmatrix} . \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} + \begin{bmatrix} f_1 \\ f_2 \\ f_3 \\ f_4 \end{bmatrix} = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} \qquad (16)$$

Or,

$$\begin{bmatrix} A & c_1 & g_1 & 0 \\ h & 0 & g_2 & e_1 \\ g & c_2 & 0 & e_2 \\ e & c_3 & g_3 & e_3 \end{bmatrix} = \begin{bmatrix} A & c \\ v & B \end{bmatrix} \quad (17)$$

Where: A – direct input coefficients matrix; x_1 is a vector of output; x_2 is total income for fold division of household groups; x_3 is total income of Government institutional; x_4 is total income of enterprises institutional; *h* is an matrix (vector) of households income groups from production; *g* is a vector of Government income form production (indirect taxes minus subsidies); *e* is an matrix of income of enterprises groups from production (operating surplus and consumption of fixed capital); c_1 is a corresponding matrix of household consumption coefficients; g_1 is a vector of Government consumption coefficients; c_2 is a vector on redistributing between the household groups and Government institutional; c_3 is a matrix on redistributing of household institutional to enterprise groups; g_2, g_3 are expenditure of Government to households and enterprises institutional; e_1, e_2, e_3 are matrixes on redistribute from enterprise institutional to household, government and other groups of enterprises. Regarding equation (18) the vector *v*, *c* and can identify as below:

$$v = \begin{bmatrix} h \\ g \\ e \end{bmatrix} \quad (18)$$

$$c = \begin{bmatrix} c_1 & g_1 & 0 \end{bmatrix} \quad (19)$$

$$B = \begin{bmatrix} 0 & g_2 & e_1 \\ c_2 & 0 & e_2 \\ c_3 & g_3 & e_3 \end{bmatrix} \quad (20)$$

$$x' = \begin{bmatrix} x_2 \\ x_3 \\ x_4 \end{bmatrix} \quad (21)$$

$$f' = \begin{bmatrix} f_2 \\ f_3 \\ f_4 \end{bmatrix} \quad (22)$$

We can re-write equation

$$\begin{bmatrix} A & c \\ v & B \end{bmatrix} . \begin{bmatrix} x_1 \\ x' \end{bmatrix} + \begin{bmatrix} f_1 \\ f' \end{bmatrix} = \begin{bmatrix} x_1 \\ x' \end{bmatrix} \quad (23)$$

Miyazawa suggested an innovative way of partitioning the system of regions and the developments of demographic – economic modeling associated with Batey and Madden (1983); the other innovative way for linking of sectoral and institutional, it is also referred as internal and external multipliers and relation (24) may be obtained:

$$\begin{bmatrix} x1 \\ x' \end{bmatrix} = \begin{bmatrix} \Delta_1 & \Delta_1.c.(I-B)^{-1} \\ \Delta_2.v.(I-A)^{-1} & \Delta_2 \end{bmatrix} . \begin{bmatrix} f1 \\ f' \end{bmatrix} \quad (24)$$

Where: Δ_1 is interpreted as enlarged Leontief inverse, the elementary of Δ_1 includes direct impact, indirect impact and induce effects by household and government consumptions, they contain elements which are larger than those of the $(I-A)^{-1}$ matrix, because they include extra output required to meet the consumption groups output effects. Δ_2 is interpreted as *enlarged Miyazawa matrix multipliers*, the matrix Δ_2 can be decomposed as follow:

$$\Delta_2 = (I - (I-B)^{-1}.v.(I-A)^{-1}.c)^{-1}.(I - B)^{-1} \quad (25)$$

$(I - B)^{-1}$ is referred as internal multipliers of re - distribution income and $(I - (I-B)^{-1}.v.(I-A)^{-1}.c)^{-1}$ is referred as external multipliers that induced effects by income from production, these mean income from re-distribution dose not dependent direct income from re-distribution of each institutional, but also dependent re-distribution income of other institutional and induced by consumption expenditure.

$\Delta_1.c$ is a matrix of production induced by endogenous consumption.

$v.(I-A)^{-1}$ is a matrix of endogenous income earned from production.

Note that equation (24) can be re write as bellow:

$$\begin{bmatrix} x1 \\ x' \end{bmatrix} = \begin{bmatrix} \Delta_{11} & 0 \\ 0 & \Delta_{22} \end{bmatrix} . \begin{bmatrix} I & (I-A)^{-1}.c \\ (I-B)^{-1}.v & I \end{bmatrix} . \begin{bmatrix} (I-A)^{-1} & 0 \\ 0 & (I-B)^{-1} \end{bmatrix} \quad (26)$$

Where:

$$\Delta_1 = \Delta_{11}.(I\text{-}A)^{-1} \text{ and } \Delta_2 = \Delta_{22}.(I\text{-}B)^{-1}$$
$$\Delta_{11} = (I - A - c.(I\text{-}B)^{-1}.v)^{-1} \text{ and } \Delta_{22} = (I - (I\text{-}B)^{-1}.v.(I\text{-}A)^{-1}.c)^{-1}$$

The equation (26) introduce the hierarchical sequence of modeling which multiplicatively separates the enlarged Leontief inverse matrix and enlarged Keynesian multipliers matrix, interrelationship multipliers from the interrelationship effects

We shall explain how to define and measure interrelationship feedback effects in interrelationship settings. Solving the equation (23), (24) and (26) for X_1 and X' yields:

$$X' = (I\text{-}B)^{-1}.v.X_1 \quad (27)$$
$$X_1 = (I\text{-}A)^{-1}.c.X' \quad (28)$$

These are the interrelationship feedback effects. The equation (27) and (28) present the relationship between production and total income.

The Demographic- Economic modeling described in table 4 below:

Table 3 : Demographic-Economic modeling 2005.

		(1) Commodity	(2) Household	(3) Government						(4) Enterprises			(5) Investment	(6) ROW	(7) Total
				VAT	Special consumption taxes	Other taxes	Import duties	Direct taxes	Transfers	State	Non-state	FDI			
1- Commodity		1x1	1x2						1x8					1x13	1x14
2- Household	Compensations of employees	2x1							2x8					2x13	2x14
3- Government	VAT	3x1													3x14
	Special consumption taxes	4x1													4x14
	Other taxes	5x1													5x14
	Import duties	6x1	6x2										6x12		6x14
	Direct taxes		7x2							7x9	7x10	7x11		7x13	7x14
	Transfers		8x2											8x13	8x14
4- Enterprises	State	9x1							9x8	9x9	9x10	9x11			9x14
	Non-State	10x1							10x8	10x9	10x10	10x11			10x14
	FDI	11x1								11x9	11x10	11x11			11x14
5- Saving			12x2	12x3						12x9	12x10	12x11		12x13	12x14
6- ROW		13x1	13x2						13x8			13x11	13x12		13x14
7- Total		14x1	14x2	14x3					14x8	14x9	14x10	14x11	14x12	14x13	14x14

Below in table is the explanation of each cell in the SAM 2005 table

Cell 1x1	represents the updated non-competitive I/O 2005, including the intermediate input matrix
Cell 2x1	Total payments by industries to household (compensations of employees)
Cells 3x1, 4x1, 5x1, 6x1	Payments by industries to government namely indirect taxes and import duties
Cells 9x1, 10x1, 11x1	Operating surpluses and depreciations of the enterprises
Cell 13x1	Total foreign imports to industry use or payments to imports
Cell 1x2	Payments made by household to commodities or total final consumption of household
Cell 6x2, 7x2, 8x2	Taxes paid by household to government
Cell 12x2	Household saving
Cell 13x2	Imports to household final demand
Cell 12x3	Government saving
Cell 1x8	Transfers made by government to state commodities
Cell 2x8	Transfers made by government to household
Cell 9x8, 10x8	Transfers made by government to state and non-state enterprises
Cell 7x9, 7x10, 7x11	Payments in terms of Direct taxes made by enterprises to government
Cell 9x9, 10x9, 11x9,0x10, 10x10, 11x10, 9x11, 10x11, 11x11	Inter-institutional transfers by enterprises to enterprises and property incomes
Cell 13x11	Transfers made by the FDI enterprises to the rest of the world
Cell 6x12	Import duties paid to the government
Cell 13x12	Import of investment goods
Cell 1x13	Export
Cell 2x13	Payments from the rest of the world to household
Cell 7x13, 8x13	Tax payments and transfers from the rest of the world to the government
Cell 12x13	Foreign transfers

VII. Conclusion

This paper is an attempt in order to present some variance of input-output expansion. The System of National Accounts with version 1968 and 1993 recommended on social accounting matrix, but until now some countries compiled SAM from supply and use tables and some other countries compiled SAM from input-output system. SAM seems to apply for CGE model but it is not meaning in SAM multipliers analysis. The parallel with ideas of social accounting system developed by Stone (1961), Pyatt and Roe (1977) is demographic - economic modeling was knew by Miyazawa's concept. These ideas developed in order to describe the interrelation between income from production, income from redistribution, consumption, accumulation, it like as "no start and no the end" in Buddha theory.

Especially, The analysis of I/O models and demographic - economic model showed the changes of the economy cause of different impacts to sectors and institutional regions. So, calculation on this element is necessary to plan the tax policy and other policies. Such as, analyze the index of power of dispersion shows that this index of the sector is very large, then, if you stimulate development of this sector, it highly impacts other sectors in the economy

References Références Referencias

1. Bacharach, M. (1970), 'Biproportional matrices and input-output change", Cambridge University press, London.
2. Batey P. W. J. & Madden M. 1983, " The Modeling of Demographic-economic Change Within the Context of Regional Decline: Analytical Procedures and Empirical Results", *Socio-Economic Plan*, Vol.17, No. 5, pp.315-328.
3. Bui Trinh, Kiyoshi Kobayashi, Kwang Moon Kim (2012) "The Supply and Use tables: The approach for conversion to input-output table" Journal of Advances in Management and Applied Economics, Volume 2, Issue 2
4. Bui Trinh, Nguyen Ngoc Anh (2009) "Updating a Vietnam SAM 2005 A hybrid approach", DEPOCEN working paper series No. 16
5. Bui Trinh, Kiyoshi Kobayashi, Nguyen Quang Thai, Nguyen Viet Phong, Pham Le Hoa (2012) "Analyzing some economic relations based on expansion input-output model" International journal of business and management, Vol. 7, No. 19- Published by Canada center of Science and education.
6. CIEM/NIAS "New SAM of Vietnam, 2000", National Politic Publishing House, Ha Noi, 2002.
7. Cohen, S. I., "A Social Accounting Matrix Analysis for the Netherlands", *D e Economist,* Summer 1988, 253-272.
8. Miller, R, and P. Blair (1985), Input-Output Analysis: Foundations and Extensions, Chapter 7 (pp. 236-260), *Environmental Input-Output Analysis*, Prentice-Hall
9. Miyazawa, K. (1976), Input-Output Analysis and the Structure of Income Distribution, *Lecture Notes in Economics and Mathematical Systems*, Berlin: Spinger-Verlag.
10. Sonis M., and Hewings, G. J. D (1999), "Miyazawa's contributions to understanding economic structure: interpretation, evaluation and extensions,"
11. Geoffrey J.D. Hewings, Michael Sonis, Moss Madden and Yoshio Kimura. 1999 "Introduction - Understanding and Interpreting Economic Structure". Springer – Verlag, Heidelberg, Germany.
12. Ngoc.Q.Pham, Bui Trinh and Thanh.D.Nguyen "Structure change and economic performance of Vietnam,1986-2000 evidence from three input output tables",2006 paper presented at intermediate meeting 2006 at Sedai, Japan.
13. Pyatt, G. and A.N. Roe (1977), *Social Accounting for Development Planning with Special Reference to Sri-Lanka*, Cambridge: Cambridge University Press.
14. Pyatt, G. and J.I. Round (eds) (1985), *SAMs: A Basis for Planning*, World Bank, Washington, D.C.
15. SNA, 1968, United Nations publication, Sales No. E. 69.XVII.3), 1968.
16. SNA, 1993, New York: a publication of the Commission of the European Communities, International Monetary Fund, Organization for Economic Cooperation and Development, United Nations, and the World Bank, 1993
17. Vietnam GSO, "Vietnam input output table, 2000", 2002, Vietnam Statistics Publishing House.

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