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Decomposition Analysis for the Comparison and the Comprehension of Conventional Input-Output Impacts' Indicators: An Empirical Paradigm

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Abstract

Sometimes, the priorities in the growing patterns create dubiousness, surprises and are proved unsuitable to re-form and redress the distortions of economy, magnifying them or even emerging news. When the external or the individual interferences are remained out of the planning, then the knowledge of why the various indices yield conflicting sectoral rankings can help the policy-makers to plan ameliorated strategies. In this paper a decomposition analysis for the components of conventional backward linkages' (BLs') indices and the corresponding type I multipliers (t.I-Ms') has been taken place, in order to support the comparison and the comprehension of conflictions that are recorded on their derived sectoral rankings. For the empirical paradigm, data from the Greek economy have been used. The indicators' appropriateness for the developmental planning has been scrutinized giving an emphasis on the model's causality, the initial exogenous stimuli and the "intrasectoral initial trends for impacts' generation". The analysis provides a proof that the BL's indices are strongly tendentious and the t.I-Ms' are preferable for the medium-to-long run growing planning.

Keywords: I-O analysis; backward linkages' indices; type I multipliers; initial exogenous stimuli; "intrasectoral initial trends for impacts' generation".

JEL classification: C18; C67; E61; O21.

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1. INTRODUCTION

I-O multipliers are used from the policy-makers for the management of developmental programming and constitute a common tool for the investigation of economic perspectives (Chisari *et al.*, 2019; Freytag and Fricke, 2017; Guang and Wen, 2020; Guerra and Sancho, 2012; Haslop *et al.*, 2017; Humavindu and Stage, 2013; Ivanova, 2014; Kakderi and Tasapoulou, 2017; Kelly *et al.*, 2016; Kolokontes and Chatzitheodoridis, 2008; Lopes and Neder, 2017; Mariolis and Soklis, 2020; Mastronardi *et al.*, 2012; Meng *et al.*, 2019; Muller-Hansen *et al.*, 2017; Nguyen *et al.*, 2018; Nguyen *et al.*, 2019; Romero *et al.*, 2019; Sancho, 2013; Thomassin, 2018). Dietzenbacher (2005) had underlined that all the I-O multipliers are not the same suitable for all the occasions, their interpretations are differentiated and their usefulness are depended on the problem that one addresses. There is a copiousness of indicators (Kolokontes *et al.*, 2019) that have been constructed to estimate multiplicative effects on output, income, employment, emissions and so forth (Dietzenbacher, 2005; Sancho, 2013; Guang and Wen, 2020), or just to order the sectors in rankings in comparison with an average mental sector (Rasmussen, 1956, pp. 133-138; Hazari, 1970). Every one of them, correct or fallacious, acceptable or rejected, historically constitute an interesting contribution, as each one of them has distributed something different or something more, another view, in the wonderings and the revolution of science. The majority of them follow the causality of standard Leontief model as for their interpretations and mathematical calculations (Kolokontes *et al.*, 2019). Others are not conformed to this causality presenting conceptual difficulties, but sustaining mathematical correct as for their ability to answer at specific questions, opening other avenues in models' construction perspectives (Cardenete *et al.*, 2017; Cardenete and Sancho, 2012; Dietzenbacher *et al.*, 2013; Kolokontes *et al.*, 2019; Sancho, 2013). However, once intuitionally, once actually, someone can discern that there is not an "in depth" comprehension of indicators' tools from the policy-planners (de Mesnard, 2002, 2004, 2007a, 2007b; Dietzenbacher, 2005; Oosterhaven, 2004, 2007; Oosterhaven and Stelder, 2002), owing to the blind and superficial use of indices through computing programmes (Lopes and Neder, 2017; Kolokontes *et al.*, 2019). The corruption, the electoral promises and the "powerless" governments opposite to the sectoral and syndicates' pressures aggravate the problem of tendentious planning (Kolokontes *et al.*, 2018).

Five issues, at least, are remained cardinal as for the derived results from the multipliers and their choice from the policy-makers for the growing planning. The first topic is the interpretation of results (de Mesnard, 2002, 2004, 2007a, 2007b; Dietzenbacher, 2005; Guang and Wen, 2020; Kolokontes *et al.*, 2019): What is exactly measured by each one index? The second issue regards the precision of indices and its margins (Kolokontes *et al.*, 2019; Milana, 1985; Romero *et al.*, 2019). The third matter concerns the revealed sectoral rankings from each one index and their suitability for the developing patterns (Kolokontes and Chatzitheodoridis, 2008; Kolokontes *et al.*, 2008; Kolokontes *et al.*, 2018). The fourth point concerns the conflictions among the obtained sectoral classifications of used indicators (Kolokontes *et al.*, 2019): Why different rankings are generated from the various indices? The fifth topic is focused on the choice of indices for the developmental strategy: Is the choice of policy-planners advisable and free from pressures or is imposed and nominated from governmental or other institutional or not factors to the way of a brew plot?

After a briefly discussion that aims to put wider bases for questionings, this paper is concentrated on the decomposition analysis for the synthetic components of conventional backward linkages' indices and their corresponding type I backward multipliers, in order to contribute a comparative comprehension of them investigating the conflictions among their sectoral rankings. The empirical outcomes provide interesting information for the tendentious propensity of each examined index "in favor of" or "against to" particular sectors, determining the roots for this bias, intending both to be of concern for the policy-makers and to help them to comprehend that they must delve deeper into the conceptual roots of indices and to explore alternative ways as a presupposition for a honest and meticulous planning even in the case of "traditional" indicators.

2. HEART-SEARCHINGS' DISCUSSION

The interpretation for the estimated measurements from the various indicators consist the offset point for the discussion. The impact indicators can be separated into two wide groups: the "non-weighted indices" and the "weighted indices". Anyone of these two groups includes traditional and less conventional indices, simultaneously. Despite of the fact that someone can read for totally innovative or/and just differentiated proposals as for the impacts' indicators in the literature, however in action the comprehension of their peculiarities are proved that remains ambiguous, even and for those that are characterized as "conventional" indices.

From the one hand, the traditional non-weighted indices are coefficients that measure counteractions that are provoked via to the inter-industry interplays, owing to special stimuli, When these coefficients are multiplied *e.g.* with the sectoral final demand or with the changes on the sectoral final demand, then the total multiplicative nominal measurements are produced. For instance, in action, such indicators are the backward linkages' (BLs') indices and the forward linkages (FLs') indices, as well as the type I multipliers (t.I-Ms') (Rasmussen, 1956, pp. 133-138; Hirschman, 1958, pp. 100-107; Augusztinovics, 1970; Bayers, 1976; Cai and Leung, 2004; Cella, 1984; Cuello *et al.*, 1992; Dietzenbacher, 2002, 2005; Jensen *et al.*, 1979; Jones, 1976; West and Jensen, 1980; Yotopoulos and Nugent, 1973; Tadayuki, 2008, pp. 40-54, 59-66, 85-87; Miller and Blair, 2009, pp. 555-558; Bekhet, 2011; Chuenchum *et al.*, 2018; Kelly *et al.*, 2016; Kolokontes *et al.*, 2019). It must be reminded that, these indicators calculate potential-promising effects, due to the fact that they ignore the sectoral magnitudes, in terms of employment or outputs, into a productive circuit (Kolokontes *et al.*, 2018; Kolokontes *et al.*, 2019).

From the other hand, someone can meet the weighted indicators that have been separated by Kolokontes *et al.* (2019) into two subgroups: *"the comparative orderings' weighted indices"* and the *"shrinking and correctional orderings' weighted indices"*. The indicators into the first subgroup are focused on the sectoral rankings' generation. These indices are not multiplicative impacts' indicators, in essence. The indices of second subgroup, taking into consideration the relative magnitude of sectors in an economy, are concentrated on an attempt to provide correctional orderings through the shrinkage of potential sectoral multiplicative effects to more realistic predictions, according with the present structure of productive circuit. The shrinkage of promising multiplicative effects is an important factor for the real significance of relative smaller sectors at the present phase of economy.

The weighted indices of second subgroup can play a crucial consultative role for the growing planning, under the presupposition that the policy-planners can control the consequences of chosen weights (Kolokontes *et al.*, 2008; Kolokontes *et al.*, 2018, 2019). The differences among the sectoral rankings that are generated from the non-weighted indices and from the *"shrinking and correctional orderings' weighted indices"*, could be concerned desirable for the purposes of planning analysis under their correct interpretation. The crucial point is the causality of differentiated outcomes to be understandable from the planners, so that they do not be led to a misleading planning. Consequently, this step comes after from the correct application of simple non-weighted indicators. For more details on this matter, as well as on the topics for the short-term boost to an economy, the necessary transitive planning for its gradual structural reformation and the long-term planning following the sectoral potential capabilities, the reader can look at Kolokontes *et al.* (2019).

Due to the fact that the indicators' rankings must be used from the policy-makers for the developmental planning, both for the short and the long period of time, the usefulness of knowledge of why the different indices yield conflicting sectoral rankings is significant. When the policy-planners possess this knowledge, then theoretically must be capable to explain why they decide a pattern based on the one or on the other index. An absence of convincing explanation always creates questions, dubiousness and distrustfulness for the honest of growing pattern. How much degree of free the policy-planners are enjoyed from the governmental instruments? How unaffected the policy-makers are remained from their individual views and desires? How unaffected the policy-planners and the governmental instruments could be kept opposite to the external sectoral and syndicates' pressures regards to their decisions? These questions are fundamentals since the comprehension of each one index and their choice from the policy-makers influences not only the planning, but moreover the structure of productive circuit and the social welfare both in the present and the future time. Hence, if the practitioners and the governmental factors have not acquired this knowledge, then it must be done in order to ameliorate their decisions.

During the time, a certainty about the interpretation of each one index is recorded. Is this certainty justifiable? Several surveys are absolutely based on the BLs' indices. Is this correct? Scrutinizing the initial exogenous stimuli and *"the intrasectoral initial trends for effects generation"* (Kolokontes *et al.*, 2019), interesting observations and inferences are revealed. Of course, this paper creates questionings for a variety of empirical inquiries that it is not accomplishable to be answered here. The goal of this paper is concentrated on the decomposition analysis for the synthetic components of conventional BLs' and t.I-Ms' and their interconnections, in an attempt for their comparison and better comprehension according to their conceptual architectures. Via an empirical paradigm, the generated different sectoral rankings from the targeting indices are pointed out and investigated, with respect both to their particular initial exogenous stimuli and their intrasectoral initial trends for impacts generation. To this target, an open and static demand-driven Leontief I-O model has been used for the results' derivation.

As for the precision of predictions, it must be underlined that the relativity of estimations from the various indices moving from an open to a closed model, create a numeric range in which each one sectoral index is fluctuated as for its expected multiplicative impacts (Milana, 1985; Kolokontes *et al.*, 2019). The margins of this range can be theoretically fluctuated between the per sector obtained computations from an open I-O model and from a completely closed model (Kolokontes *et al.*, 2019). In this vein, the interesting in the case of I-O indicators is shifted from the "absolutely precision" to the "relative-fluctuated precision" and of course on the sectoral rankings.

Following the above debate, the paper is organized as follows. The next section presents the methodology and the data; while in continue the decomposition analysis of indices' components have been taken place. The last section is a recapitulation of the main deductions.

3. DATA AND METHODOLOGY

For the empirical analysis, the symmetric Greek I-O table of 2015 that has been published from the Hellenic Statistical Authority and the vector of sectoral employment for the year 2015 (Hellenic Statistical Authority, 2017, 2019), have been used for the derivation of BLs' indices and t.I-Ms'. The table was adapted into a scheme of 59 sectors. The Table no. 1 depicts the sectoral aggregations. Letters from the English alphabet are corresponding to each one sector and are used in the next tables.

Table no. 1 – The Codes of Sectoral Classifications and the Followed Sectoral Notations

SIC Code	Sectoral Notation	Sectors	SIC Code	Sectoral Notation	Sectors
CPA_A01	A	Agriculture and hunting products	CPA_H52	AE	Warehousing and support services for transportation
CPA_A02	B	Forestry and logging products	CPA_H53	AF	Postal and courier services
CPA_A03	C	Fish, fishing and aquaculture products & supporting services	CPA_I	AG	Accommodation and food services
CPA_B	D	Mining and quarrying products	CPA_J58	AH	Publishing services
CPA_C10-C12	E	Food, beverages and tobacco products	CPA_J59_J60	AI	Motion picture, video and TV programme production services, sound recording and music publishing, programming and broadcasting services
CPA_C13-C15	F	Textiles, wearing apparel & leather products	CPA_J61	AJ	Telecommunications services
CPA_C16	G	Wood & cork products (except furniture) & articles of straw & plaiting materials	CPA_J62_J63	AK	Computer. Programming, with consultancy & information services
CPA_C17	H	Paper and paper products	CPA_K64	AL	Financial services, except insurance and pension funding
CPA_C18	I	Printing and recording services	CPA_K65	AM	Insurance, reinsurance and pension funding services, except compulsory security
CPA_C19	J	Coke and refined petroleum products	CPA_K66	AN	Services auxiliary to financial services and insurance services
CPA_C20	K	Chemicals and chemical products	CPA_L68A_L68B	AO	Real estate services & imputed rent of owner-occupied dwellings

SIC Code	Sectoral Notation	Sectors	SIC Code	Sectoral Notation	Sectors
CPA_C21	L	Basic pharmaceutical products and preparations	CPA_M69 _M70	AP	Legal, accounting & head offices & consulting services
CPA_C22	M	Rubber and plastics products	CPA_M71	AQ	Architectural and engineering; technical testing & analysis serv.
CPA_C23	N	Other non-metallic mineral products	CPA_M72	AR	Scientific research and development services
CPA_C24	O	Basic metals	CPA_M73	AS	Advertising and market research services
CPA_C25	P	Fabricated metal products, except machinery and equipment	CPA_M74 _M75	AT	Other professional, scientific and technical services; veterinary services
CPA_C26-C28	Q	Electrical equipment; Computers, electronic and optical products; Machinery and equipment	CPA_N77	AU	Rental and leasing services
CPA_C29_ C30	R	Motor vehicles, trailers and semi-trailers; Other transport equipment	CPA_N78	AV	Employment services
CPA_C31_ C32	S	Furniture and other manufactured goods	CPA_N79	AW	Travel agency, tour operator and other reservation services
CPA_C33	T	Repair and installation services of machinery and equipment	CPA_N80-N82	AX	Security and investigation services, services to buildings and landscape & office administrative & business support services
CPA_D35	U	Electricity, gas, steam and air-conditioning	CPA_O84	AY	Public administration & defense; compulsory social security
CPA_E36	V	Natural water; water treatment & supply services	CPA_P85	AZ	Education services
CPA_C37-E39	W	Sewerage; waste collection & treatment and disposal activities; materials recovery; remediation activities and other waste management activities	CPA_Q86	BA	Human health services
CPA_F	X	Constructions and construction works	CPA_Q87 _Q88	BB	Social work services
CPA_G45	Y	Wholesale and retail trade & repair services of motor vehicles and motorcycles	CPA_R90-R92	BC	Creative, arts and entertainment, library-museum and other cultural services, gambling & betting services
CPA_G46	Z	Wholesale trade services (except of motor vehicles &	CPA_R93	BD	Sporting services and amusement and recreation services

SIC Code	Sectoral Notation	Sectors	SIC Code	Sectoral Notation	Sectors
		motorcycles)			
CPA_G47	AA	Retail trade services (except of motor vehicles and motorcycles)	CPA_S94	BE	Services furnished by membership organizations
CPA_H49	AB	Land transport services and transport services via pipelines	CPA_S95	BF	Repair services of computers and personal and household goods
CPA_H50	AC	Water transport services	CPA_S96	BG	Other personal services
CPA_H51	AD	Air transport services			

1. The Standard Industrial Classification of Eurostat was followed from the Hellenic Statistical Authority.
2. The sectoral terminology of Hellenic Statistical Authority (with which the data have been published in Eurostat) was followed.

The fundamental equations that constitute the pylons for an I-O model and the equations for the computation of BLs' and the t.I-Ms' and their synthetic components are the follows (Augusztinovics, 1970; Bekhet, 2011, 2012; Cardenete *et al.*, 2017; Chuenchum *et al.*, 2018; Cuello *et al.*, 1992; de Mesnard, 2002, 2004, 2007a, 2007b; Dietzenbacher, 2005; Dietzenbacher and Lahr, 2004; Freytag and Fricke, 2017; Guang and Wen, 2020; Hirschman, 1958; Ivanova, 2014; Jensen *et al.*, 1979, pp. 20-22; Kelly, 2015; Kelly *et al.*, 2016; Kolokontes and Chatzitheodoridis, 2008; Kolokontes *et al.*, 2008; Kolokontes *et al.*, 2018, 2019; Lahiri, 2000; Lenzen, 2003; Leontief, 1936, 1951; Lopes and Neder, 2017; Meng *et al.*, 2019; Milana, 1985; Miller and Blair, 2009, pp. 16-27, 31-34; Muller-Hansen *et al.*, 2017; Nguyen *et al.*, 2018; Nguyen *et al.*, 2019; Robinson, 2006; Romero *et al.*, 2019; Romero *et al.*, 2009; Sancho, 2012, 2013; Sonis *et al.*, 1995; Tadayuki, 2008, pp. 40-54; Thomassin, 2018; West and Jensen, 1980; Yotopoulos and Nugent, 1973), in which: In=Initial, D=Direct, Ir=Indirect, B=Backward, L=Linkage, E=Effects, O=Output, W=Income or Wages and Salaries (for the notation of InDIrBWE), I=Income or Wages and Salaries (for the notation of t.I-IMs'), E=Employment, Y=Final Demand, M=Multiplier, M=Matrix (in some cases), T=Total, Tr=Truncated, r=reformed and i,j=1,2,…,n.

$$Z = A < X > \Rightarrow A = Z < X >^{-1} \quad (1)$$

$A = [a_{ji}] = [Z_{ji} / X_i]$ is the direct requirements matrix derived from the transactions matrix Z, with the elements $[a_{ji}]$ to express the individual direct coefficients.

$$X = Zi + Y = A < X > i + Y \quad (2)$$

$X = [X_i]$ is the vector of sectoral outputs and the symbol "<>" is used to denote a vector's conversion to a diagonal matrix; while $< X >^{-1}$ is the inverse of diagonal matrix $< X >$; $Y = [Y_i]$ is the vector of final demand; and i indicates a vector with all its elements to be equal to one.

$$X = AX + Y \Rightarrow X - AX = Y \Rightarrow (I - A)X = Y \Rightarrow X = (I - A)^{-1} Y, \quad B = (I - A)^{-1} \quad (3)$$

$B = (I - A)^{-1} = [b_{ji}]$ is the Leontief's inverse matrix, with the elements $[b_{ji}]$ to express the individual total (initial, direct and indirect) impacts coefficients.

$$< InSE >=< S >< X >^{-1} \Rightarrow < S >=< InSE >< X > \quad (4)$$

$< InSE >=< S >< X >^{-1}$ is the diagonal matrix of intrasectoral initial trends for the effects generation of a kind "S" [in which the measured kind "S" of effects can express once the impacts on employment (E), or in another case the impacts on the income (or wages, W), *e.t.c.*]; and $InSE_i = (S_i / X_i)$ denotes per sector these intrasectoral initial trends for effects generation of a targeting kind "S" (see: Kolokontes *et al*., 2019).

and: $STBL = InDIrBSE = i'(STM) = i' < InSE > (I - A)^{-1} = i' < S >< X >^{-1} (I - A)^{-1}$ (5)

The generalized STBLs' index reflects the total (initial, direct and indirect) BLs' index for the factor "S" (see: Kolokontes *et al*., 2019). The per sector enunciation for the estimated total multiplicative effects on the factor "S", is calculated by the form:

$$STBL_i = InDIrBSE_i = \sum_{j=1}^{n} b_{ji} InSE_j = \sum_{j=1}^{n} b_{ji} (S_j / X_j).$$

$$OTBL_i = InDIrBOE_i = \sum_{j=1}^{n} b_{ji} InOE_j = \sum_{j=1}^{n} b_{ji} \quad (6)$$

The OTBLs' index (S=O) denotes the total multiplicative effects on the sectoral gross output, following the BLs' conceptual definition, due to an "initial exogenous stimulus": dY_i, that happens to be at an identification with the *"intrasectoral initial trend for effects generation on the output"* because of the causality of model according to which: $InOE_i = X_i / X_i = dX_i / dX_i = dX_i / dY_i = 1$, $\forall i$ (see: Kolokontes *et al*., 2019).

$$ETBL_i = InDIrBEE_i = \sum_{j=1}^{n} b_{ji} InEE_j = \sum_{j=1}^{n} b_{ji} (E_j / X_j) \quad (7)$$

The ETBLs' index (S=E) is referred to the estimated total multiplicative effects on the employment of productive circuit, owing to the per se conceptual heterogeneity between the "sectoral initial exogenous stimulus": dY_i, and its *"intrasectoral initial trend for effects generation on the employment"*: $InEE_i = E_i / X_i < 1$ (see: Kolokontes *et al*., 2019). With the same way can be defined the WTBLs' index (S=W) for the estimated total multiplicative effects on the income of economy, following the BLs' conceptual enunciation.

$$SDBL = DBSE = i'(SDM) = i' < InSE > A = i' < S >< X >^{-1} A \quad (8)$$

The generalized SDBLs' index measures exclusively the direct effects per kind "S". The per sector expression for the estimated direct multiplicative effects on the factor "S", is defined as:

$$DBSE_i = \sum_{j=1}^{n} a_{ji} InSE_j = \sum_{j=1}^{n} a_{ji} (S_j / X_j) .$$

Especially, in the case of output, this indicator takes the form: $DBOE_i = \sum_{j=1}^{n} a_{ji}$, due to the causality of Leontief's model (Kolokontes *et al.*, 2019).

However, in the case of employment, this index takes the form:

$DBEE_i = \sum_{j=1}^{n} a_{ji} InEE_j = \sum_{j=1}^{n} a_{ji} (E_j / X_j)$, due to the heterogeneity between the "sectoral initial exogenous stimulus": dY_i , and its *"intrasectoral initial trend for effects generation on the employment"*: $InEE_i = E_i / X_i < 1$, (see: Kolokontes *et al.*, 2019), and so forth for anyone else measured factor "S".

$$TrSTBL_i = DIrBSE_i = InDIrBSE_i - InSE_i \tag{9}$$

This is the generalized approach for the isolation of direct and indirect spillovers per kind "S" of effects,

while:

$$IrBSE_i = InDIrBSE_i - DBSE_i - InSE_i \tag{10}$$

is the generalized approach for the isolation of indirect spillovers per kind "S" of effects.

$$SM = i' < S >< X >^{-1} (I - A)^{-1} (i' < S >< X >^{-1})^{-1} = i' < InSE > (I - A)^{-1} (i' < InSE >)^{-1}$$
$$= i'(STM)(i' < InSE >)^{-1} = InDIrBSE'(i' < InSE >)^{-1} = rInDIrBSE' \tag{11}$$

This is the generalized t.I-SM for any factor "S". The per sector enunciation for the estimated type I - Multiplier for a factor "S", can be calculated using the equation:

$SM_i = (InDIrBSE_i / InSE_i) / rInSE_i = rInDIrBSE_i / rInSE_i$

$$= r(\sum_{j=1}^{n} b_{ji} InSE_j) / rInSE_i = r(\sum_{j=1}^{n} b_{ji} InSE_j)/1 = r\sum_{j=1}^{n} b_{ji} InSE_j .$$

Especially in the case of t.I-OM, the index takes the form:

$OM_i = (InDIrBOE_i / InOE_i) / rInOE_i = (\sum_{j=1}^{n} b_{ji} /1)/1 = \sum_{j=1}^{n} b_{ji}$, and is identified with the InDIrBOE (or OTBL) index, due to the causality: $InOE_i = X_i / X_i = 1$ (Kolokontes *et al.*, 2019).

However, in the case of t.I-EM, the index is founded as:

$EM_i = (InDIrBEE_i / InEE_i) / rInEE_i$

$= r(\sum_{j=1}^{n} b_{ji} InEE_j) / rInEE_i = r(\sum_{j=1}^{n} b_{ji} InEE_j)/1 = r\sum_{j=1}^{n} b_{ji} InEE_j$, in which the "intrasectoral initial trend for effects generation on the employment" is identified with the "initial exogenous stimulus": $InEE_i = E_i / X_i = 1$, due to the specific conceptual architecture that this index follows (for more details p.v.: Kolokontes *et al.*, 2019). With the same way can be defined the t.I-IM, as a vector or/and individually.

Evidently from the identification of equations (6) and (11), the t.I-OMs' and the TOBLs' are the same measurements since both these two indices have the same and equal to one ($InOE_i = 1 = dY_i$) offset stimuli. This consonance is not be in force for the pair of InDIrBEE indices and the t.I-EMs', nor for the pair of InDIrBWE and the t.I-IMs', due to the fact that the indicators in each one of these pairs have different offset stimuli.

In particular, the InDIrBEE and the InDIrBWE indices are met their initial exogenous stimulus at the unitary change on sectoral final demand, and these automatous means that their intrasectoral initial trends for effects generation on the employment and on the income, respectively, is less than the unit $(InEE_i < 1, InWE_i < 1)$. Especially, in the case of employment effects these coefficients are very small absolute numbers, due to the fact that they are originated from a combination of physical units of employees with monetary units of sectoral gross outputs. Hence, when a sectoral InEE is for example 0.00000555, this magnitude reflects an intra-industry ability for 5.55 more employees engaged in the specific sector, if its final demand and output are increased by 1000000 monetary units. In the case of InWE the numbers are also less than one, but are not so small, since in this case are exclusively combined each other, only monetary units.

It is elucidated that the t.I-EMs' and the t.I-IMs' have another offset base, since in their cases the initial exogenous stimuli are coincided with the intrasectoral initial trends for effects generation on the employment and on the income (InEE and InWE), respectively (for more details p.v.: Kolokontes *et al.*, 2019), and are equal to one $(InEE_i = InWE_i = 1)$. This has as consequences: in the case of employment, to be measured multiplicative employment effects on the whole of economy due to straightforward changes on the physical units of sectoral employment (regardless of the requisite corresponding change on the sectoral monetary final demand); and in the case of income, to be measured multiplicative income effects to the rest of economy due to outright changes on monetary units of sectoral income (regardless of the requisite corresponding change of sectoral monetary final demand).

Virtually, the BLs' indicators because of their computable architecture yield noteworthy differentiated sectoral rankings than the corresponding t.I-Ms'. The following decomposition analysis for these indicators' components provides an adequate and comprehensible representation of why. Moreover, the analysis reveals the prejudiced propensity of each one from the examined index "in favor of" or "against to" particular sectors, determining the resource of this bias. This analysis can be useful not only to policy-planners, but especially to new scholars and researchers.

4. DECOMPOSITION ANALYSIS OF INDICES' COMPONENTS

Table no. 2 presents the sectoral rankings from the InDIrBEE index and the comparison with the corresponding t.I-EM. It is easy for someone to discern that these rankings differ substantially. Attempting to explore the reason of why this is happens, a decomposition analysis for the components of InDIrBEE and the t.I-EM is presented and explicated as follows, using the elements from the Tables no. 2 and no. 3.

For this scope, the intrasectoral initial trends for effects generation on the employment (InEE), the direct backward employment effects (DBEE), the indirect backward employment effects (IrBEE) and the summation of direct and indirect backward employment effects (DIrBEE=TrETBL) have been calculated and isolated (Table no. 2, columns: [4], [5], [6], [7], respectively). As it is ascertained the direct effects (first round of effects) are larger than the indirect effects (the successive round of effects) (Table no. 2, columns: [5],[6]). Scrutinizing the columns of InEE [4] and InDIrBEE [3] and their divisions (column [8], proportion: InEE/InDIrBEE) are deduced that in many sectoral cases the main component for the configuration of InDIrBEE is the InEE (which is: $InEE_i < 1$, by definition). From the measurements of InEE and their divisions with the corresponding InDIrBEE are turned out that when the InEE consists a significant part of the InDIrBEE (see in Table no. 2 the sectors: AZ, BG, BB, AA, AQ, A, B, BD, I, *e.t.c.*), then the InEE is the basic component that determines the InDIrBEE and its sectoral ranking. In contrast, when the proportion of InEE consist a smaller part, than the corresponding proportion of DIrBEE, for the configuration of the InDIrBEE (*e.g.* the sectors: J, AC, E, AD, BE, O, H, AW, AR, M, AU, AH, V), then the classifications by the InDIrBEE criterion mostly depends on the summation of DIrBEE (which is the "truncated" sectoral ETBLs' index without the InEE). This means that as smaller as the InEE, as bigger will be the sectoral propensity to spread multiplicative employment impacts to the rest of economy.

In conflict with the InDIrBEE index (Table no. 2, col.[3]), the formation of magnitudes and rankings for the t.I-EM (Table no. 2, col.[2] & Table no. 3, col.[2]) are not conformed to the InDIrBEE ones. Contemplating the why, as a first step is pointed out the fact that, due to the conceptual enunciation of t.I-EMs', their initial exogenous stimuli and their corresponding intrasectoral initial trends for effects generation on the employment are identified and are equal to the unit $(InEE_i = 1)$ (see the reformed rInEE in Table no. 3, col.[3]; and compare with the non-adjusted InEE in Table no. 2, col.[4]). This means that the magnitude of InEE is transferred to one (1) in the case of t.I-EMs' computations and this unity magnitude denote both the initial exogenous stimulus and the intrasectoral initial trend for effects generation. Although the fact that the InDIrBEE are decimal numbers less than 1, converting the InEE as equal to 1, automatous the calibration of the DIrBEE and the InDIrBEE are converted and reformed to the corresponding appropriate magnitudes for the computation of t.I-EMs' that will be greater than one (Kolokontes *et al.*, 2019).

For example, for the sector A have estimated that the InEE=0.00003987 (Table no. 2, col.[4]) and DIrBEE=0.00000985 (Table no. 2, col.[7]), and so the configuration of InDIrBEE index is: 0.00003987+0.00000985=0.00004972 (Table no. 2, col.[3]). While, when the rInEE=1 (r=reformed), then the rDIrBEE= (0.00000985/0.00003987) = 0.2470 (the reformed "truncated" sectoral t.I-EM, in which the unitary InEE is not included; see Table no. 3, col.[6]) and the rInDIrBEE = (0.00004972/0.00003987) = 1.2470 (the reformed "total" t.I-EM, in which the unitary InEE is included; see Table no. 3 col.[2]). After from the reformation of measures for the rInEE (Table no. 3,col.[3]), rDBEE (=t.I-BDEM, Table no. 3, col.[4]), rIrBEE (=t.I-BIrEM, Table no. 3, col. [5]), rDIrBEE (=t.I-TrBEM, Table no. 3, col.[6]) to the appropriate levels for the definition of t.I-EMs' (rInDIrBEE=t.I-BEM, Table no. 3, col.[2]), the subtraction between the "total" and the "truncated" t.I-BEM (rInDIrBEE-rDIrBEE) must be equal to one (rInEE=1, see Table no. 3col.[3]). For the used example: InEE = InDIrBEE - DIrBEE = 1.2470 - 0.2470 = 1 (using in the analysis 11 decimal digits for the computations of BLs' and their components).

Hence, the equalization of InEE to the unit leads to the formation of t.I-BEMs' via the reformation of BLs' magnitudes. The reformation of estimated direct and indirect effects, as well as the reformation of their summation, for the construction of type I multipliers, do not distort the proportions among them, as the reader can ascertain comparing the columns [9], [10], [11] of table 2 with the columns [7], [8], [9] of Table no. 3. In general, for any factor "S" the following equations are true and confirm correct calculations:

- (t.I-BDSM/t.I-BSM)=(rDBSE/rInDIrBSE)=(DBSE/InDIrBSE).
- (t.I-BIrSM/t.I-BSM)=(rIrBSE/rInDIrBSE)=(IrBSE/InDIrBSE).
- (t.I-TrBSM/t.I-BSM)=(rDIrBSE/rInDIrBSE)=(DIrBSE/InDIrBSE).

Stayed in focus on the columns [11] of Table no. 2 and [9] of Table no. 3, someone can observe that their ranking are in a consonance to the corresponding sectoral classifications of t.I-EM as they are presented on the column [2] in the Table no. 2 and Table no. 3. As the reader can check studying the Table no. 4 and no. 5, analogous inferences are derived in the case of income, and of course for any other measured factor "S".

From the analysis is obvious that when the initial exogenous effects are concentrated on final demand stimuli, then the "total" intra-industry (initial, direct and indirect) multiplicative effect are: b_{jj} and the "truncated" intra-industry direct and indirect multiplicative effect are: $(b_{jj}-1)$; while when the initial exogenous stimuli coincide to the intrasectoral initial trends for impacts generation and are equal to one (1) something that is happened for example in the case of t.I-EMs' and t.I-IMs' then the "total" intra-industry (initial, direct and indirect) multiplicative effect are: $b_{jj} InEE_j$ (or: $b_{jj} InWE_j$, respectively), and the "truncated" intra-industry direct and indirect multiplicative effect are: $[(b_{jj} InEE_j) - InEE_j]$ (or: $[(b_{jj} InWE_j) - InWE_j]$, respectively) (Kolokontes *et al.*, 2019). These individual intrasectoral magnitudes, either are included into the corresponding intersectoral indicators of "total" BLs' and into the t.I-Ms', or are not included into their "truncated" versions (Table no. 2, col.: [3][4][7] & Table no. 3, col. [2],[3],[6]; Table no. 4, col.:[3],[4],[7] & Table no. 5, col.[2],[3],[6]).

After the former analysis a noticeable question is whose index the results are the right. All the calculated results can regard correct under of the conceptual enunciation of each one index and their special definitions and combinations as for the exogenous initial stimuli and the intrasectoral initial trends for impacts generation. However, all these indices are not the same suitable for the growing planning.

From the decomposition analysis between the BLs' and the t.I-SMs', the InDIrBSE index have the inequitable propensity to reveal as more important for the economy these sectors, in which the InSE consist a significant part for their configuration (for instance see the divisions: InEE/InDIrBEE, or InWE/InDIrBWE, respectively, in Table no. 2 & Table no. 4: column [8]). This is owed to the fact that the InDIrBSE are affected from the noteworthy sectoral InSE magnitudes. As a consequence, the InDIrBSE indices reward the sectors with significant concentration of intrasectoral effects, instead to reward the sectors with important dispersion of intersectoral spillovers. From the other hand, the t.I-SMs' (here: or t.I-BEMs' and t.I-BIMs') are shaped up after from their reformation under a neutral consideration of rInSE=1 (Table no. 3 & Table no. 5: columns [2],[3],[6]). This means that in the case of the t.I-SMs' (like as the t.I-EMs' and the t.I-IMs') the rInSE consists a neutral initial base for all the sectors, and a neutral element for all the calculations of t.I-SMs' and their truncated enunciations. Hence, it helps the t.I-SMs' to reveal the sectors with significant potential capabilities to diffuse intersectoral spillovers to the whole economy. Following the view that the policy planning must be based on the sectors' capability to disperse multiplicative effects to the rest of the economy so as to be succeeded a rational and more efficient structural development over the time, in an attempt to avoid the cases of sectoral hydrocephalism and the biased distortions in the productive network, the t.I-Ms' are more appropriate for the task of policy-makers, than the BLs' indices.

If the policy-planners comprehend the above peculiarities of described indicators, then the choice of traditional BLs' indices for the growing planning seems to be misleading and to generate dubiousness and distrustfulness for the honest of the planning creating suspicious as for their compliance to individual benefits or/and to external governmental, sectoral and syndicalistic pressures. For instance, for an employment growing planning, someone could deliberately to use the conventional BLs' indicators to recommend as more important, sectors like as the: A, B, I, AA, AQ, AZ, BD, BG, BB that are on the top of the InDIrBEE ranking according to the results of table 2. However, all these sectors are usually "employment intensive sectors" and their choice due to their large intrasectoral impacts' absorption leads to a growing intrasectoral introversion, instead to create the perspectives for a more effective development for the structure of economy. In the same way, for an income enlargement planning, someone could deliberately to use the index InDIrBWE to recommend as more important, sectors like as the: AF, AV, AX, AY, AZ, BB, BD, BE, BG, that are on the top of its ranking according to the results of Table no. 4.

Alternatively, the t.I-Ms' overcome this problem revealing as more significant for the long-term growing planning both "capital intensive" and "employment intensive" sectors, like as the: J, AC, E, AD, O, H, AW, AR, M, AU, AH, for the case of employment expansion; and the: A, E, G, H, J, O, AC, AD, AW for the case of income expansion. Consequently, when the policy-planners do not take into consideration the indices' peculiarities, then they lead the planning and the productive structure to wrong ways and distortions.

5. CONCLUSION

The comprehension of indices' peculiarities and the correct interpretation for their outcomes can help the policy-planners to construct meticulous growing patterns, under the presupposition that their individual benefits and the external pressures are not intervene in the process. After the decomposition analysis for the synthetic components of BLs' and t.I-Ms', the choice of t.I-Ms' for the medium-to-long run developmental planning is preferable than this of BLs' indicators, due to the fact that the latter have inherent the inequitable propensity to bring out as more important for the economy the sectors with a high intra-industry absorption of multiplicative effects. In contradiction, the crucial point for the growing patterns is to target the sectors that can disperse significant inter-industry spillovers to the rest of economy, avoiding the unilateral intrasectoral hydro-cephalisms, and these sectors are revealed from the t.I-Ms'. Of course, in the evolutional process all the sectors in a productive circuit must not have the same size, but each one sector must take this size that serves as better as it can the social welfare in the given phase of economy and at the specific time. The Hirschmanian unbalanced sectoral development seems to be in a correct way with erroneous tools (BLs').

Table no. 2 – Decomposition Analysis of Employment BLs' Indices & Comparison of Rankings from the ETBL and t.I.-BEM

Sectors [1]	**t.I-BEM [2]**	**InDIrBEE = ETBL [3]**	**InEE [4]**	**DBEE = EDBL [5]**	**IrBEE = EIrBL [6]**	**DIrBEE = TrETBL [7]**	**InEE / InDIrBEE or else: InEE / ETBL [8]**	**DBEE / InDIrBEE or else: EDBL / ETBL [9]**	**IrEE / InDIrBEE or else: EIrBL / ETBL [10]**	**DIrBEE / InDIrBEE or else: TrETBL / ETBL [11]**
A	1.24709 (47)	0.00004972 (04)	0.00003987 (05)	0.00000715 (04)	0.00000271 (08)	0.00000985 (04)	80.19% (13)	14.37% (47)	5.44% (47)	19.81% (47)
B	1.21586 (49)	0.00003598 (07)	0.00002959 (08)	0.00000492 (15)	0.00000147 (29)	0.00000639 (17)	82.25% (11)	13.68% (48)	4.08% (51)	17.75% (49)
C	1.30515 (43)	0.00001577 (25)	0.00001208 (24)	0.00000251 (39)	0.00000118 (36)	0.00000369 (40)	76.62% (17)	15.89% (43)	7.49% (42)	23.38% (43)
D	1.80904 (19)	0.00000203 (57)	0.00000112 (57)	0.00000072 (58)	0.00000019 (58)	0.00000091 (58)	55.28% (41)	35.16% (15)	9.57% (33)	44.72% (19)
E	3.51030 (04)	0.00001972 (22)	0.00000562 (42)	0.00001047 (04)	0.00000363 (04)	0.00001410 (01)	28.49% (56)	53.09% (04)	18.43% (09)	71.51% (04)
F	1.41370 (38)	0.00000824 (47)	0.00000583 (40)	0.00000177 (01)	0.00000064 (52)	0.00000241 (49)	70.74% (22)	21.55% (36)	7.71% (40)	29.26% (38)
G	1.69549 (24)	0.00002968 (10)	0.00001750 (15)	0.00000790 (47)	0.00000427 (02)	0.00001217 (03)	58.98% (36)	26.62% (26)	14.40% (17)	41.02% (24)
H	2.62917 (08)	0.00000879 (45)	0.00000334 (47)	0.00000333 (03)	0.00000211 (13)	0.00000545 (21)	38.03% (52)	37.91% (09)	24.05% (05)	61.97% (08)
I	1.24087 (48)	0.00003375 (08)	0.00002720 (09)	0.00000413 (26)	0.00000242 (11)	0.00000655 (15)	80.59% (12)	12.24% (50)	7.17% (44)	19.41% (48)
J	13.62359 (01)	0.00000368 (55)	0.00000027 (58)	0.00000232 (19)	0.00000108 (41)	0.00000341 (42)	7.34% (59)	63.20% (01)	29.46% (02)	92.66% (01)
K	1.87056 (16)	0.00000361 (56)	0.00000193 (55)	0.00000112 (42)	0.00000056 (54)	0.00000168 (55)	53.46% (44)	30.92% (17)	15.62% (13)	46.54% (16)
L	1.83955 (17)	0.00000531 (53)	0.00000288 (51)	0.00000176 (55)	0.00000066 (51)	0.00000242 (48)	54.36% (43)	33.19% (16)	12.45% (26)	45.64% (17)
M	2.14004 (11)	0.00000929 (44)	0.00000434 (44)	0.00000346 (48)	0.00000149 (26)	0.00000495 (27)	46.73% (49)	37.26% (11)	16.01% (12)	53.27% (11)
N	1.83314 (18)	0.00001108 (38)	0.00000604 (37)	0.00000337 (24)	0.00000166 (21)	0.00000503 (24)	54.55% (42)	30.43% (18)	15.02% (14)	45.45% (18)
O	2.63681 (07)	0.00000683 (51)	0.00000259 (52)	0.00000258 (25)	0.00000166 (22)	0.00000424 (34)	37.92% (53)	37.80% (10)	24.27% (04)	62.08% (07)
P	1.57261 (28)	0.00001375 (32)	0.00000874 (30)	0.00000318 (29)	0.00000182 (16)	0.00000501 (25)	63.59% (32)	23.14% (30)	13.27% (23)	36.41% (28)
Q	1.89294 (15)	0.00000419 (54)	0.00000221 (54)	0.00000127 (53)	0.00000071 (49)	0.00000198 (52)	52.83% (45)	30.25% (20)	16.93% (11)	47.17% (15)
R	1.41747 (37)	0.00000169 (58)	0.00000119 (56)	0.00000034 (59)	0.00000015 (59)	0.00000050 (59)	70.55% (23)	20.46% (40)	9.00% (35)	29.45% (37)
S	1.54242 (30)	0.00001198 (36)	0.00000776 (31)	0.00000274 (36)	0.00000147 (28)	0.00000421 (35)	64.83% (30)	22.89% (32)	12.28% (28)	35.17% (30)
T	1.73288 (22)	0.00001039 (41)	0.00000599 (39)	0.00000297 (33)	0.00000142 (31)	0.00000439 (32)	57.71% (38)	28.61% (22)	13.69% (21)	42.29% (22)
U	1.60583 (27)	0.00000659 (52)	0.00000410 (46)	0.00000154 (50)	0.00000095 (44)	0.00000249 (47)	62.27% (33)	23.37% (29)	14.36% (18)	37.73% (27)
V	2.00298 (14)	0.00001223 (35)	0.00000611 (36)	0.00000453 (17)	0.00000159 (23)	0.00000612 (18)	49.93% (46)	37.06% (12)	13.01% (24)	50.07% (14)
W	1.48811 (34)	0.00000844 (46)	0.00000567 (41)	0.00000184 (46)	0.00000093 (46)	0.00000277 (46)	67.20% (26)	21.76% (35)	11.05% (31)	32.80% (34)
X	1.67941 (25)	0.00002378 (16)	0.00001416 (20)	0.00000675 (05)	0.00000287 (06)	0.00000962 (05)	59.54% (35)	28.37% (24)	12.09% (29)	40.46% (25)
Y	1.15360 (51)	0.00002523 (14)	0.00002187 (10)	0.00000224 (43)	0.00000112 (40)	0.00000336 (43)	86.68% (09)	8.86% (52)	4.45% (50)	13.32% (51)
Z	1.77322 (20)	0.00001064 (40)	0.00000600 (38)	0.00000307 (30)	0.00000157 (24)	0.00000464 (29)	56.39% (40)	28.89% (21)	14.72% (16)	43.61% (20)
AA	1.07836 (56)	0.00005124 (03)	0.00004752 (03)	0.00000247 (40)	0.00000126 (35)	0.00000372 (39)	92.73% (04)	4.81% (57)	2.45% (56)	7.27% (56)
AB	1.51822 (32)	0.00002183 (20)	0.00001438 (19)	0.00000503 (13)	0.00000243 (10)	0.00000745 (10)	65.87% (28)	23.02% (31)	11.11% (30)	34.13% (32)
AC	4.34322 (03)	0.00001026 (42)	0.00000236 (53)	0.00000546 (08)	0.00000244 (09)	0.00000790 (08)	23.02% (57)	53.24% (03)	23.74% (06)	76.98% (03)

AD	3.45796 (05)	0.00001017 (43)	0.00000294 (50)	0.00000504 (12)	0.00000219 (12)	0.00000723 (11)	28.92% (55)	49.54% (05)	21.54% (07)	71.08% (05)
AE	1.64504 (26)	0.00000751 (48)	0.00000457 (43)	0.00000201 (45)	0.00000094 (45)	0.00000295 (45)	60.79% (34)	26.73% (25)	12.49% (25)	39.21% (26)
AF	1.28574 (46)	0.00002607 (12)	0.00002027 (12)	0.00000401 (21)	0.00000179 (17)	0.00000579 (19)	77.78% (14)	15.37% (46)	6.85% (45)	22.22% (46)
AG	1.55591 (29)	0.00002576 (13)	0.00001656 (16)	0.00000551 (07)	0.00000370 (03)	0.00000920 (07)	64.27% (31)	21.38% (37)	14.35% (19)	35.73% (29)
AH	2.03636 (13)	0.00001418 (31)	0.00000696 (34)	0.00000521 (10)	0.00000200 (14)	0.00000721 (12)	49.11% (47)	36.79% (14)	14.11% (20)	50.89% (13)
AI	1.41322 (39)	0.00002189 (19)	0.00001549 (17)	0.00000464 (16)	0.00000176 (19)	0.00000640 (16)	70.76% (21)	21.20% (38)	8.04% (39)	29.24% (39)
AJ	1.72511 (23)	0.00000747 (49)	0.00000433 (45)	0.00000213 (44)	0.00000101(42)	0.00000314 (44)	57.97% (37)	28.50% (23)	13.53% (22)	42.03% (23)
AK	1.48932 (33)	0.00001521 (27)	0.00001021 (26)	0.00000362 (23)	0.00000137 (33)	0.00000500 (26)	67.14% (27)	23.82% (28)	9.04% (34)	32.86% (33)
AL	1.52862 (31)	0.00001103 (39)	0.00000722 (33)	0.00000283 (35)	0.00000099 (43)	0.00000382 (37)	65.42% (29)	25.64% (27)	8.94% (36)	34.58% (31)
AM	1.74858 (21)	0.00001346 (33)	0.00000770 (32)	0.00000409 (20)	0.00000167 (20)	0.00000576 (20)	57.19% (39)	30.43% (19)	12.38% (27)	42.81% (21)
AN	1.45247 (36)	0.00001451 (30)	0.00000999 (27)	0.00000326 (28)	0.00000126 (34)	0.00000452 (31)	68.85% (24)	22.48% (33)	8.67% (37)	31.15% (36)
AO	7.76096 (02)	0.00000143 (59)	0.00000018 (59)	0.00000081 (57)	0.00000044 (56)	0.00000124 (56)	12.88% (58)	56.63% (02)	30.48% (01)	87.12% (02)
AP	1.10407 (55)	0.00002208 (18)	0.00002000 (13)	0.00000137 (52)	0.00000071 (50)	0.00000208 (51)	90.57% (05)	6.22% (55)	3.21% (54)	9.43% (55)
AQ	1.11242 (54)	0.00004524 (05)	0.00004067 (04)	0.00000301 (31)	0.00000156 (25)	0.00000457 (30)	89.89% (06)	6.66% (54)	3.44% (53)	10.11% (54)
AR	2.24280 (10)	0.00000688 (50)	0.00000307 (49)	0.00000264 (37)	0.00000118 (37)	0.00000381 (38)	44.59% (50)	38.33% (08)	17.09% (10)	55.41% (10)
AS	1.32251 (42)	0.00001796 (23)	0.00001358 (23)	0.00000290 (34)	0.00000148 (27)	0.00000438 (33)	75.61% (18)	16.16% (42)	8.23% (38)	24.39% (42)
AT	1.30367 (44)	0.00001509 (28)	0.00001157 (25)	0.00000237 (41)	0.00000114 (38)	0.00000351 (41)	76.71% (16)	15.72% (45)	7.57% (41)	23.29% (44)
AU	2.07366 (12)	0.00001336 (34)	0.00000644 (35)	0.00000495 (14)	0.00000197 (15)	0.00000692 (14)	48.22% (48)	37.03% (13)	14.74% (15)	51.78% (12)
AV	1.14316 (52)	0.00001564 (26)	0.00001368 (22)	0.00000148 (51)	0.00000048 (55)	0.00000196 (53)	87.48% (08)	9.47% (51)	3.05% (55)	12.52% (52)
AW	2.42919 (09)	0.00002306 (17)	0.00000949 (29)	0.00000912 (02)	0.00000445 (01)	0.00001357 (02)	41.17% (51)	39.54% (07)	19.29% (08)	58.83% (09)
AX	1.34275 (40)	0.00002750 (11)	0.00002048 (11)	0.00000525 (09)	0.00000177 (18)	0.00000702 (13)	74.47% (20)	19.09% (41)	6.44% (46)	25.53% (40)
AY	1.33823 (41)	0.00002003 (21)	0.00001497 (18)	0.00000416 (18)	0.00000090 (47)	0.00000506 (22)	74.73% (19)	20.78% (39)	4.49% (49)	25.27% (41)
AZ	1.03553 (59)	0.00003311 (09)	0.00003197 (06)	0.00000085 (56)	0.00000028 (57)	0.00000114 (57)	96.57% (01)	2.57% (58)	0.86% (59)	3.43% (59)
BA	1.20787 (50)	0.00002397 (15)	0.00001984 (14)	0.00000299 (32)	0.00000113 (39)	0.00000412 (36)	82.79% (10)	12.48% (49)	4.73% (48)	17.21% (50)
BB	1.07643 (57)	0.00007128 (01)	0.00006621 (01)	0.00000368 (22)	0.00000138 (32)	0.00000506 (23)	92.90% (03)	5.17% (56)	1.93% (57)	7.10% (57)
BC	1.47801 (35)	0.00001461 (29)	0.00000988 (28)	0.00000327 (27)	0.00000145 (30)	0.00000472 (28)	67.66% (25)	22.42% (34)	9.93% (32)	32.34% (35)
BD	1.30013 (45)	0.00004052 (06)	0.00003117 (07)	0.00000644 (06)	0.00000292 (05)	0.00000935 (06)	76.92% (15)	15.88% (44)	7.20% (43)	23.08% (45)
BE	3.42827 (06)	0.00001112 (37)	0.00000324 (48)	0.00000507 (11)	0.00000280 (07)	0.00000788 (09)	29.17% (54)	45.61% (06)	25.22% (03)	70.83% (06)
BF	1.12670 (53)	0.00001593 (24)	0.00001414 (21)	0.00000118 (54)	0.00000061 (53)	0.00000179 (54)	88.75% (07)	7.40% (53)	3.85% (52)	11.25% (53)
BG	1.03577 (58)	0.00006668 (02)	0.00006438 (02)	0.00000155 (49)	0.00000075 (48)	0.00000230 (50)	96.55% (02)	2.32% (59)	1.13% (58)	3.45% (58)

1. Obtained by authors' calculations.
2. Numbers in parenthesis represent sectoral rankings.
3. The sectoral terminology of Hellenic Statistical Authority (with which the data have been published in Eurostat) was followed.

Table no. 3 – Decomposition Analysis of Type I Backward Employment Multipliers & Their Connection With the Backward Linkages Indices

Sectors [1]	t.I-BEM [2]	rInEE [3]	t.I-BDEM or else: = rEDBL or else: =rDBEE [4]	t.I-BIrEM or else: = rEIrBL or else: = rIrBEE [5]	t.I-TrBEM or else: = rTrETBL or else: = rDIrBEE [6]	t.I-BDEM / t.I-BEM = rDBEE / rInDIrBEE [7]	t.I-BIrEM / t.I - BEM = rIrBEE / rInDIrBEE [8]	t.I-TrBEM / t.I-BEM = rDIrBEE / rInDIrBEE [9]	Sectoral to National Employment [10]
A	1.24709 (47)	1,0000	0.17922 (47)	0.06787 (47)	0.24709 (47)	14.37% (47)	5.44% (47)	19.81% (47)	12.37% (02)
B	1.21586 (49)	1,0000	0.16627 (48)	0.04959 (51)	0.21586 (49)	13.68% (48)	4.08% (51)	17.75% (49)	0.17% (54)
C	1.30515 (43)	1,0000	0.20744 (43)	0.09771 (42)	0.30515 (43)	15.89% (43)	7.49% (42)	23.38% (43)	0.36% (38)
D	1.80904 (19)	1,0000	0.63600 (15)	0.17304 (30)	0.80904 (19)	35.16% (15)	9.57% (33)	44.72% (19)	0.29% (47)
E	3.51030 (04)	1,0000	1.86349 (04)	0.64681 (06)	2.51030 (04)	53.09% (04)	18.43% (09)	71.51% (04)	3.40% (08)
F	1.41370 (38)	1,0000	0.30464 (37)	0.10907 (39)	0.41370 (38)	21.55% (36)	7.71% (40)	29.26% (38)	0.74% (22)
G	1.69549 (24)	1,0000	0.45137 (25)	0.24412 (19)	0.69549 (24)	26.62% (26)	14.40% (17)	41.02% (24)	0.33% (43)
H	2.62917 (08)	1,0000	0.99678 (08)	0.63239 (08)	1.62917 (08)	37.91% (09)	24.05% (05)	61.97% (08)	0.20% (51)
I	1.24087 (48)	1,0000	0.15192 (49)	0.08895 (44)	0.24087 (48)	12.24% (50)	7.17% (44)	19.41% (48)	0.36% (40)
J	13.62359 (01)	1,0000	8.61038 (01)	4.01321 (01)	12.62359 (01)	63.20% (01)	29.46% (02)	92.66% (01)	0.13% (58)
K	1.87056 (16)	1,0000	0.57831 (17)	0.29225 (14)	0.87056 (16)	30.92% (17)	15.62% (13)	46.54% (16)	0.30% (44)
L	1.83955 (17)	1,0000	0.61053 (16)	0.22902 (23)	0.83955 (17)	33.19% (16)	12.45% (26)	45.64% (17)	0.36% (37)
M	2.14004 (11)	1,0000	0.79744 (11)	0.34260 (11)	1.14004 (11)	37.26% (11)	16.01% (12)	53.27% (11)	0.35% (41)
N	1.83314 (18)	1,0000	0.55783 (19)	0.27531 (16)	0.83314 (18)	30.43% (18)	15.02% (14)	45.45% (18)	0.36% (39)
O	2.63681 (07)	1,0000	0.99681 (07)	0.64000 (07)	1.63681 (07)	37.80% (10)	24.27% (04)	62.08% (07)	0.42% (35)
P	1.57261 (28)	1,0000	0.36393 (29)	0.20868 (26)	0.57261 (28)	23.14% (30)	13.27% (23)	36.41% (28)	0.90% (17)
Q	1.89294 (15)	1,0000	0.57253 (18)	0.32041 (12)	0.89294 (15)	30.25% (20)	16.93% (11)	47.17% (15)	0.52% (28)
R	1.41747 (37)	1,0000	0.28995 (39)	0.12752 (36)	0.41747 (37)	20.46% (40)	9.00% (35)	29.45% (37)	0.16% (57)
S	1.54242 (30)	1,0000	0.35308 (31)	0.18934 (29)	0.54242 (30)	22.89% (32)	12.28% (28)	35.17% (30)	0.54% (26)
T	1.73288 (22)	1,0000	0.49572 (22)	0.23716 (20)	0.73288 (22)	28.61% (22)	13.69% (21)	42.29% (22)	0.22% (50)
U	1.60583 (27)	1,0000	0.37522 (28)	0.23062 (22)	0.60583 (27)	23.37% (29)	14.36% (18)	37.73% (27)	0.73% (23)
V	2.00298 (14)	1,0000	0.74230 (14)	0.26068 (18)	1.00298 (14)	37.06% (12)	13.01% (24)	50.07% (14)	0.17% (53)
W	1.48811 (34)	1,0000	0.32374 (36)	0.16437 (32)	0.48811 (34)	21.76% (35)	11.05% (31)	32.80% (34)	0.47% (32)
X	1.67941 (25)	1,0000	0.47644 (24)	0.20296 (28)	0.67941 (25)	28.37% (24)	12.09% (29)	40.46% (25)	4.02% (07)
Y	1.15360 (51)	1,0000	0.10224 (52)	0.05136 (50)	0.15360 (51)	8.86% (52)	4.45% (50)	13.32% (51)	1.72% (14)
Z	1.77322 (20)	1,0000	0.51224 (21)	0.26098 (17)	0.77322 (20)	28.89% (21)	14.72% (16)	43.61% (20)	3.04% (09)
AA	1.07836 (56)	1,0000	0.05188 (57)	0.02647 (56)	0.07836 (56)	4.81% (57)	2.45% (56)	7.27% (56)	13.54% (01)
AB	1.51822 (32)	1,0000	0.34949 (32)	0.16873 (31)	0.51822 (32)	23.02% (31)	11.11% (30)	34.13% (32)	2.39% (12)

AC	4.34322 (03)	1,0000	2.31227 (03)	1.03095 (03)	3.34322 (03)	53.24% (03)	23.74% (06)	76.98% (03)	0.77% (21)
AD	3.45796 (05)	1,0000	1.71317 (05)	0.74479 (05)	2.45796 (05)	49.54% (05)	21.54% (07)	71.08% (05)	0.25% (48)
AE	1.64504 (26)	1,0000	0.43965 (26)	0.20538 (27)	0.64504 (26)	26.73% (25)	12.49% (25)	39.21% (26)	0.81% (18)
AF	1.28574 (46)	1,0000	0.19767 (46)	0.08807 (45)	0.28574 (46)	15.37% (46)	6.85% (45)	22.22% (46)	0.44% (34)
AG	1.55591 (29)	1,0000	0.33258 (33)	0.22333 (24)	0.55591 (29)	21.38% (37)	14.35% (19)	35.73% (29)	9.02% (03)
AH	2.03636 (13)	1,0000	0.74911 (13)	0.28725 (15)	1.03636 (13)	36.79% (14)	14.11% (20)	50.89% (13)	0.29% (45)
AI	1.41322 (39)	1,0000	0.29964 (38)	0.11357 (38)	0.41322 (39)	21.20% (38)	8.04% (39)	29.24% (39)	0.32% (42)
AJ	1.72511 (23)	1,0000	0.49170 (23)	0.23341 (21)	0.72511 (23)	28.50% (23)	13.53% (22)	42.03% (23)	0.81% (19)
AK	1.48932 (33)	1,0000	0.35469 (30)	0.13463 (35)	0.48932 (33)	23.82% (28)	9.04% (34)	32.86% (33)	0.59% (25)
AL	1.52862 (31)	1,0000	0.39198 (27)	0.13664 (34)	0.52862 (31)	25.64% (27)	8.94% (36)	34.58% (31)	1.64% (15)
AM	1.74858 (21)	1,0000	0.53206 (20)	0.21652 (25)	0.74858 (21)	30.43% (19)	12.38% (27)	42.81% (21)	0.51% (29)
AN	1.45247 (36)	1,0000	0.32650 (35)	0.12597 (37)	0.45247 (36)	22.48% (33)	8.67% (37)	31.15% (36)	0.29% (46)
AO	7.76096 (02)	1,0000	4.39509 (02)	2.36587 (02)	6.76096 (02)	56.63% (02)	30.48% (01)	87.12% (02)	0.17% (56)
AP	1.10407 (55)	1,0000	0.06865 (55)	0.03541 (54)	0.10407 (55)	6.22% (55)	3.21% (54)	9.43% (55)	2.85% (10)
AQ	1.11242 (54)	1,0000	0.07411 (54)	0.03830 (53)	0.11242 (54)	6.66% (54)	3.44% (53)	10.11% (54)	1.86% (13)
AR	2.24280 (10)	1,0000	0.85957 (10)	0.38323 (10)	1.24280 (10)	38.33% (08)	17.09% (10)	55.41% (10)	0.19% (52)
AS	1.32251 (42)	1,0000	0.21371 (42)	0.10880 (40)	0.32251 (42)	16.16% (42)	8.23% (38)	24.39% (42)	0.48% (31)
AT	1.30367 (44)	1,0000	0.20500 (45)	0.09867 (41)	0.30367 (44)	15.72% (45)	7.57% (41)	23.29% (44)	0.40% (36)
AU	2.07366 (12)	1,0000	0.76790 (12)	0.30576 (13)	1.07366 (12)	37.03% (13)	14.74% (15)	51.78% (12)	0.17% (55)
AV	1.14316 (52)	1,0000	0.10829 (51)	0.03487 (55)	0.14316 (52)	9.47% (51)	3.05% (55)	12.52% (52)	0.06% (59)
AW	2.42919 (09)	1,0000	0.96061 (09)	0.46857 (09)	1.42919 (09)	39.54% (07)	19.29% (08)	58.83% (09)	0.53% (27)
AX	1.34275 (40)	1,0000	0.25631 (41)	0.08645 (46)	0.34275 (40)	19.09% (41)	6.44% (46)	25.53% (40)	1.62% (16)
AY	1.33823 (41)	1,0000	0.27809 (40)	0.06015 (48)	0.33823 (41)	20.78% (39)	4.49% (49)	25.27% (41)	8.66% (04)
AZ	1.03553 (59)	1,0000	0.02663 (58)	0.00890 (59)	0.03553 (59)	2.57% (58)	0.86% (59)	3.43% (59)	8.14% (05)
BA	1.20787 (50)	1,0000	0.15070 (50)	0.05717 (49)	0.20787 (50)	12.48% (49)	4.73% (48)	17.21% (50)	5.22% (06)
BB	1.07643 (57)	1,0000	0.05562 (56)	0.02081 (57)	0.07643 (57)	5.17% (56)	1.93% (57)	7.10% (57)	0.72% (24)
BC	1.47801 (35)	1,0000	0.33130 (34)	0.14670 (33)	0.47801 (35)	22.42% (34)	9.93% (32)	32.34% (35)	0.77% (20)
BD	1.30013 (45)	1,0000	0.20652 (44)	0.09361 (43)	0.30013 (45)	15.88% (44)	7.20% (43)	23.08% (45)	0.48% (30)
BE	3.42827 (06)	1,0000	1.56353 (06)	0.86474 (04)	2.42827 (06)	45.61% (06)	25.22% (03)	70.83% (06)	0.47% (33)
BF	1.12670 (53)	1,0000	0.08337 (53)	0.04333 (52)	0.12670 (53)	7.40% (53)	3.85% (52)	11.25% (53)	0.24% (49)
BG	1.03577 (58)	1,0000	0.02405 (59)	0.01172 (58)	0.03577 (58)	2.32% (59)	1.13% (58)	3.45% (58)	2.71% (11)

1. Obtained by authors' calculations.
2. Numbers in parenthesis represent sectoral rankings.
3. The sectoral terminology of Hellenic Statistical Authority (with which the data have been published in Eurostat) was followed.

Table no. 4 – Decomposition Analysis of Income BLs' Indices & Comparison of Rankings from the WTBL and t.I.-BIM

Sectors [1]	t.I-BIM [2]	InDIrBWE = WTBL [3]	InWE [4]	DBWE = WDBL [5]	IrBWE = WIrBL [6]	DIrBWE = TrWTBL [7]	InWE / InDIrBWE or else: InWE / WTBL [8]	DBWE / InDIrBWE or else: WDBL / WTBL [9]	IrWE / InDIrBWE or else: WIrBL / WTBL [10]	DIrBWE / InDIrBWE or else: TrWTBL / WTBL [11]
A	2.52001 (05)	0.12256980 (49)	0.04863855 (55)	0.04621792 (37)	0.02771333 (23)	0.07393125 (33)	39.68% (55)	37.71% (05)	22.61% (03)	60.32% (05)
B	1.35831 (41)	0.20523867 (36)	0.15109874 (28)	0.03707932 (45)	0.01706061 (42)	0.05413993 (44)	73.62% (19)	18.07% (40)	8.31% (36)	26.38% (41)
C	1.65692 (21)	0.14153926 (48)	0.08542335 (41)	0.03799422 (43)	0.01812170 (37)	0.05611591 (43)	60.35% (39)	26.84% (19)	12.80% (21)	39.65% (21)
D	1.44435 (31)	0.04572412 (58)	0.03165719 (56)	0.01074924 (58)	0.00331769 (58)	0.01406694 (58)	69.24% (29)	23.51% (27)	7.26% (41)	30.76% (31)
E	2.12592 (09)	0.17175473 (43)	0.08079088 (43)	0.05559107 (25)	0.03537277 (11)	0.09096385 (19)	47.04% (51)	32.37% (12)	20.59% (09)	52.96% (09)
F	1.43512 (32)	0.10375240 (52)	0.07229525 (47)	0.02220555 (52)	0.00925160 (54)	0.03145715 (53)	69.68% (28)	21.40% (33)	8.92% (33)	30.32% (32)
G	2.35371 (06)	0.18607372 (39)	0.07905564 (45)	0.06244997 (19)	0.04456810 (04)	0.10701808 (13)	42.49% (54)	33.56% (10)	23.95% (01)	57.51% (06)
H	2.19359 (08)	0.16532679 (45)	0.07536805 (46)	0.05487063 (29)	0.03508811 (12)	0.08995874 (20)	45.59% (52)	33.19% (11)	21.22% (06)	54.41% (08)
I	1.40220 (36)	0.38094541 (14)	0.27167604 (17)	0.06862948 (15)	0.04063990 (05)	0.10926937 (10)	71.32% (24)	18.02% (41)	10.67% (26)	28.68% (36)
J	4.83009 (01)	0.07572107 (56)	0.01567696 (59)	0.04199901 (41)	0.01804510 (39)	0.06004411 (41)	20.70% (59)	55.47% (01)	23.83% (02)	79.30% (01)
K	1.51349 (27)	0.07992998 (55)	0.05281163 (53)	0.01780340 (55)	0.00931495 (53)	0.02711835 (55)	66.07% (33)	22.27% (29)	11.65% (23)	33.93% (27)
L	1.68056 (19)	0.09624891 (53)	0.05727209 (51)	0.02799660 (50)	0.01098022 (50)	0.03897682 (49)	59.50% (41)	29.09% (17)	11.41% (25)	40.50% (19)
M	1.99575 (10)	0.16123800 (46)	0.08079072 (44)	0.05587791 (24)	0.02456937 (28)	0.08044728 (26)	50.11% (50)	34.66% (07)	15.24% (14)	49.89% (10)
N	1.65655 (22)	0.21668601 (32)	0.13080532 (32)	0.05804487 (23)	0.02783582 (22)	0.08588069 (22)	60.37% (38)	26.79% (20)	12.85% (20)	39.63% (22)
O	2.25006 (07)	0.14293596 (47)	0.06352549 (49)	0.04928993 (32)	0.03012054 (17)	0.07941047 (29)	44.44% (53)	34.48% (08)	21.07% (08)	55.56% (07)
P	1.69225 (18)	0.20949493 (35)	0.12379674 (35)	0.05348002 (31)	0.03221817 (14)	0.08569819 (24)	59.09% (42)	25.53% (23)	15.38% (13)	40.91% (18)
Q	1.64714 (23)	0.08574371 (54)	0.05205603 (54)	0.02117665 (53)	0.01251104 (48)	0.03368769 (51)	60.71% (37)	24.70% (25)	14.59% (15)	39.29% (23)
R	1.48099 (28)	0.02434608 (59)	0.01643908 (58)	0.00534078 (59)	0.00256622 (59)	0.00790700 (59)	67.52% (32)	21.94% (31)	10.54% (27)	32.48% (28)
S	1.81035 (15)	0.10391227 (51)	0.05739894 (50)	0.02845467 (49)	0.01805865 (38)	0.04651332 (47)	55.24% (45)	27.38% (18)	17.38% (11)	44.76% (15)
T	1.44473 (30)	0.23106890 (29)	0.15993963 (27)	0.04708975 (36)	0.02403952 (29)	0.07112927 (34)	69.22% (30)	20.38% (35)	10.40% (28)	30.78% (30)
U	1.35134 (42)	0.18214254 (40)	0.13478628 (29)	0.03100632 (46)	0.01634994 (45)	0.04735626 (46)	74.00% (18)	17.02% (45)	8.98% (32)	26.00% (42)
V	1.42292 (34)	0.40446869 (12)	0.28425327 (15)	0.09187368 (03)	0.02834174 (20)	0.12021542 (05)	70.28% (26)	22.71% (28)	7.01% (43)	29.72% (34)
W	1.32202 (45)	0.23407765 (28)	0.17706087 (25)	0.04025698 (42)	0.01675980 (43)	0.05701678 (42)	75.64% (15)	17.20% (44)	7.16% (42)	24.36% (45)
X	1.98169 (11)	0.25793246 (27)	0.13015768 (33)	0.08076231 (07)	0.04701247 (03)	0.12777478 (03)	50.46% (49)	31.31% (14)	18.23% (10)	49.54% (11)
Y	1.28661 (47)	0.27648298 (22)	0.21489241 (22)	0.04228041 (39)	0.01931016 (36)	0.06159057 (39)	77.72% (13)	15.29% (47)	6.98% (44)	22.28% (47)
Z	1.33198 (43)	0.32165961 (19)	0.24148902 (19)	0.05432189 (30)	0.02584870 (25)	0.08017059 (27)	75.08% (17)	16.89% (46)	8.04% (39)	24.92% (43)
AA	1.23622 (49)	0.36787614 (17)	0.29758177 (13)	0.04874627 (34)	0.02154811 (32)	0.07029437 (35)	80.89% (11)	13.25% (48)	5.86% (50)	19.11% (49)
AB	1.65750 (20)	0.27398023 (25)	0.16529721 (26)	0.07051244 (13)	0.03817059 (07)	0.10868302 (12)	60.33% (40)	25.74% (22)	13.93% (17)	39.67% (20)
AC	2.70699 (04)	0.18177724 (41)	0.06715117 (48)	0.07609302 (09)	0.03853304 (06)	0.11462606 (07)	36.94% (56)	41.86% (02)	21.20% (07)	63.06% (04)

AD	3.16621 (02)	0.16880355 (44)	0.05331412 (52)	0.07824583 (08)	0.03724360 (09)	0.11548943 (06)	31.58% (58)	46.35% (04)	22.06% (04)	68.42% (02)
AE	1.39855 (37)	0.18746400 (38)	0.13404200 (30)	0.03744946 (44)	0.01597254 (46)	0.05342200 (45)	71.50% (23)	19.98% (36)	8.52% (35)	28.50% (37)
AF	1.23723 (48)	0.48774394 (08)	0.39422115 (07)	0.06309795 (18)	0.03042483 (16)	0.09352279 (18)	80.83% (12)	12.94% (50)	6.24% (47)	19.17% (48)
AG	1.88853 (14)	0.21454355 (33)	0.11360327 (39)	0.06553233 (16)	0.03540795 (10)	0.10094028 (15)	52.95% (46)	30.55% (15)	16.50% (12)	47.05% (14)
AH	1.43427 (33)	0.41446842 (11)	0.28897441 (14)	0.09159367 (04)	0.03390034 (13)	0.12549401 (04)	69.72% (27)	22.10% (30)	8.18% (37)	30.28% (33)
AI	1.36151 (39)	0.36990437 (15)	0.27168641 (16)	0.06910511 (14)	0.02911286 (19)	0.09821796 (16)	73.45% (21)	18.68% (38)	7.87% (40)	26.55% (39)
AJ	1.52343 (26)	0.17498045 (42)	0.11485958 (38)	0.04212469 (40)	0.01799617 (40)	0.06012087 (40)	65.64% (34)	24.07% (26)	10.28% (29)	34.36% (26)
AK	1.35858 (40)	0.33347279 (18)	0.24545612 (18)	0.06492834 (17)	0.02308834 (30)	0.08801667 (21)	73.61% (20)	19.47% (37)	6.92% (45)	26.39% (40)
AL	1.21296 (50)	0.36959469 (16)	0.30470555 (12)	0.04825953 (35)	0.01662961 (44)	0.06488914 (36)	82.44% (10)	13.06% (49)	4.50% (51)	17.56% (50)
AM	1.80130 (16)	0.23024620 (30)	0.12782189 (34)	0.07444641 (11)	0.02797791 (21)	0.10242431 (14)	55.52% (44)	32.33% (13)	12.15% (22)	44.48% (16)
AN	1.41178 (35)	0.26342082 (26)	0.18658740 (24)	0.05552034 (26)	0.02131308 (33)	0.07683342 (31)	70.83% (25)	21.08% (34)	8.09% (38)	29.17% (35)
AO	1.93195 (13)	0.04782544 (57)	0.02475501 (57)	0.01629452 (57)	0.00677591 (56)	0.02307043 (56)	51.76% (47)	34.07% (09)	14.17% (16)	48.24% (13)
AP	1.17453 (54)	0.27524972 (23)	0.23434921 (21)	0.02872886 (47)	0.01217165 (49)	0.04090051 (48)	85.14% (06)	10.44% (55)	4.42% (53)	14.86% (54)
AQ	1.74653 (17)	0.20067767 (37)	0.11490053 (37)	0.05927264 (20)	0.02650451 (24)	0.08577715 (23)	57.26% (43)	29.54% (16)	13.21% (19)	42.74% (17)
AR	1.20403 (52)	0.46321054 (10)	0.38471760 (08)	0.05862879 (22)	0.01986415 (35)	0.07849294 (30)	83.05% (08)	12.66% (51)	4.29% (54)	16.95% (52)
AS	1.44851 (29)	0.27410601 (24)	0.18923304 (23)	0.05924201 (21)	0.02563096 (26)	0.08487297 (25)	69.04% (31)	21.61% (32)	9.35% (31)	30.96% (29)
AT	1.32224 (44)	0.31027599 (21)	0.23465982 (20)	0.05528377 (27)	0.02033240 (34)	0.07561617 (32)	75.63% (16)	17.82% (42)	6.55% (46)	24.37% (44)
AU	1.96104 (12)	0.22996138 (31)	0.11726504 (36)	0.08077272 (06)	0.03192362 (15)	0.11269634 (09)	50.99% (48)	35.12% (06)	13.88% (18)	49.01% (12)
AV	1.07197 (57)	0.54423459 (06)	0.50769626 (06)	0.02847818 (48)	0.00806014 (55)	0.03653833 (50)	93.29% (03)	5.23% (57)	1.48% (58)	6.71% (57)
AW	3.03607 (03)	0.31069869 (20)	0.10233579 (40)	0.13983918 (01)	0.06852371 (01)	0.20836289 (01)	32.94% (57)	45.01% (03)	22.05% (05)	67.06% (03)
AX	1.30632 (46)	0.48148875 (09)	0.36858443 (09)	0.08360812 (05)	0.02929621 (18)	0.11290432 (08)	76.55% (14)	17.36% (43)	6.08% (48)	23.45% (46)
AY	1.11630 (56)	0.61485762 (05)	0.55079742 (04)	0.04897466 (33)	0.01508554 (47)	0.06406020 (37)	89.58% (04)	7.97% (56)	2.45% (56)	10.42% (56)
AZ	1.03193 (59)	0.71273506 (02)	0.69068448 (01)	0.01745391 (56)	0.00459667 (57)	0.02205059 (57)	96.91% (01)	2.45% (59)	0.64% (59)	3.09% (59)
BA	1.19219 (53)	0.38806926 (13)	0.32550875 (11)	0.04533000 (38)	0.01723051 (41)	0.06256051 (38)	83.88% (07)	11.68% (52)	4.44% (52)	16.12% (53)
BB	1.15696 (55)	0.71829198 (01)	0.62084181 (03)	0.07516353 (10)	0.02228664 (31)	0.09745017 (17)	86.43% (05)	10.46% (54)	3.10% (55)	13.57% (55)
BC	1.59675 (24)	0.21368778 (34)	0.13382704 (31)	0.05526746 (28)	0.02459328 (27)	0.07986075 (28)	62.63% (36)	25.86% (21)	11.51% (24)	37.37% (24)
BD	1.52453 (25)	0.50946333 (07)	0.33417663 (10)	0.12662341 (02)	0.04866329 (02)	0.17528670 (02)	65.59% (35)	24.85% (24)	9.55% (30)	34.41% (25)
BE	1.20992 (51)	0.62857327 (04)	0.51951723 (05)	0.07123343 (12)	0.03782262 (08)	0.10905605 (11)	82.65% (09)	11.33% (53)	6.02% (49)	17.35% (51)
BF	1.37477 (38)	0.11460761 (50)	0.08336516 (42)	0.02104027 (54)	0.01020218 (51)	0.03124245 (54)	72.74% (22)	18.36% (39)	8.90% (34)	27.26% (38)
BG	1.05185 (58)	0.66425139 (03)	0.63150670 (02)	0.02276646 (51)	0.00997823 (52)	0.03274469 (52)	95.07% (02)	3.43% (58)	1.50% (57)	4.93% (58)

1. Obtained by authors' calculations.
2. Numbers in parenthesis represent sectoral rankings.
3. The sectoral terminology of Hellenic Statistical Authority (with which the data have been published in Eurostat) was followed.

Table no. 5 – Decomposition Analysis of Type I Backward Income Multipliers & Their Connection With the Backward Linkages Indices

Sectors [1]	t.I-BIM [2]	rInWE [3]	t.I-BDIM or else: = rWDBL or else: =rDBWE [4]	t.I-BIrIM or else: = rWIrBL or else: = rIrBWE [5]	t.I-TrBIM or else: = rTrWTBL or else: = rDIrBWE [6]	t.I-BDIM / t.I-BIM = rDBWE / rInDIrBWE [7]	t.I-BIrIM / t.I-BIM = rIrBWE / rInDIrBWE [8]	t.I-TrBIM / t.I-BIM = rDIrBWE / rInDIrBWE [9]	Sectoral to National Employment [10]
A	2.52001 (05)	1,0000	0.95023 (05)	0.56978 (05)	1.52001 (05)	37.71% (05)	22.61% (03)	60.32% (05)	12.37% (02)
B	1.35831 (41)	1,0000	0.24540 (41)	0.11291 (38)	0.35831 (41)	18.07% (40)	8.31% (36)	26.38% (41)	0.17% (54)
C	1.65692 (21)	1,0000	0.44478 (19)	0.21214 (22)	0.65692 (21)	26.84% (19)	12.80% (21)	39.65% (21)	0.36% (38)
D	1.44435 (31)	1,0000	0.33955 (27)	0.10480 (41)	0.44435 (31)	23.51% (27)	7.26% (41)	30.76% (31)	0.29% (47)
E	2.12592 (09)	1,0000	0.68809 (11)	0.43783 (09)	1.12592 (09)	32.37% (12)	20.59% (09)	52.96% (09)	3.40% (08)
F	1.43512 (32)	1,0000	0.30715 (33)	0.12797 (32)	0.43512 (32)	21.40% (33)	8.92% (33)	30.32% (32)	0.74% (22)
G	2.35371 (06)	1,0000	0.78995 (06)	0.56376 (06)	1.35371 (06)	33.56% (10)	23.95% (01)	57.51% (06)	0.33% (43)
H	2.19359 (08)	1,0000	0.72804 (08)	0.46556 (08)	1.19359 (08)	33.19% (11)	21.22% (06)	54.41% (08)	0.20% (51)
I	1.40220 (36)	1,0000	0.25262 (39)	0.14959 (29)	0.40220 (36)	18.02% (41)	10.67% (26)	28.68% (36)	0.36% (40)
J	4.83009 (01)	1,0000	2.67903 (01)	1.15106 (01)	3.83009 (01)	55.47% (01)	23.83% (02)	79.30% (01)	0.13% (58)
K	1.51349 (27)	1,0000	0.33711 (28)	0.17638 (25)	0.51349 (27)	22.27% (29)	11.65% (23)	33.93% (27)	0.30% (44)
L	1.68056 (19)	1,0000	0.48883 (18)	0.19172 (23)	0.68056 (19)	29.09% (17)	11.41% (25)	40.50% (19)	0.36% (37)
M	1.99575 (10)	1,0000	0.69164 (09)	0.30411 (13)	0.99575 (10)	34.66% (07)	15.24% (14)	49.89% (10)	0.35% (41)
N	1.65655 (22)	1,0000	0.44375 (20)	0.21280 (21)	0.65655 (22)	26.79% (20)	12.85% (20)	39.63% (22)	0.36% (39)
O	2.25006 (07)	1,0000	0.77591 (07)	0.47415 (07)	1.25006 (07)	34.48% (08)	21.07% (08)	55.56% (07)	0.42% (35)
P	1.69225 (18)	1,0000	0.43200 (21)	0.26025 (16)	0.69225 (18)	25.53% (23)	15.38% (13)	40.91% (18)	0.90% (17)
Q	1.64714 (23)	1,0000	0.40680 (24)	0.24034 (17)	0.64714 (23)	24.70% (25)	14.59% (15)	39.29% (23)	0.52% (28)
R	1.48099 (28)	1,0000	0.32488 (29)	0.15610 (27)	0.48099 (28)	21.94% (31)	10.54% (27)	32.48% (28)	0.16% (57)
S	1.81035 (15)	1,0000	0.49574 (17)	0.31462 (11)	0.81035 (15)	27.38% (18)	17.38% (11)	44.76% (15)	0.54% (26)
T	1.44473 (30)	1,0000	0.29442 (35)	0.15030 (28)	0.44473 (30)	20.38% (35)	10.40% (28)	30.78% (30)	0.22% (50)
U	1.35134 (42)	1,0000	0.23004 (43)	0.12130 (34)	0.35134 (42)	17.02% (45)	8.98% (32)	26.00% (42)	0.73% (23)
V	1.42292 (34)	1,0000	0.32321 (30)	0.09971 (42)	0.42292 (34)	22.71% (28)	7.01% (43)	29.72% (34)	0.17% (53)
W	1.32202 (45)	1,0000	0.22736 (44)	0.09466 (43)	0.32202 (45)	17.20% (44)	7.16% (42)	24.36% (45)	0.47% (32)
X	1.98169 (11)	1,0000	0.62050 (13)	0.36120 (10)	0.98169 (11)	31.31% (14)	18.23% (10)	49.54% (11)	4.02% (07)
Y	1.28661 (47)	1,0000	0.19675 (47)	0.08986 (45)	0.28661 (47)	15.29% (47)	6.98% (44)	22.28% (47)	1.72% (14)
Z	1.33198 (43)	1,0000	0.22495 (46)	0.10704 (40)	0.33198 (43)	16.89% (46)	8.04% (39)	24.92% (43)	3.04% (09)
AA	1.23622 (49)	1,0000	0.16381 (48)	0.07241 (50)	0.23622 (49)	13.25% (48)	5.86% (50)	19.11% (49)	13.54% (01)

AB	1.65750 (20)	1,0000	0.42658 (22)	0.23092 (18)	0.65750 (20)	25.74% (22)	13.93% (17)	39.67% (20)	2.39% (12)
AC	2.70699 (04)	1,0000	1.13316 (04)	0.57383 (04)	1.70699 (04)	41.86% (02)	21.20% (07)	63.06% (04)	0.77% (21)
AD	3.16621 (02)	1,0000	1.46764 (02)	0.69857 (02)	2.16621 (02)	46.35% (04)	22.06% (04)	68.42% (02)	0.25% (48)
AE	1.39855 (37)	1,0000	0.27939 (36)	0.11916 (35)	0.39855 (37)	19.98% (36)	8.52% (35)	28.50% (37)	0.81% (18)
AF	1.23723(48)	1,0000	0.16006 (49)	0.07718 (48)	0.23723 (48)	12.94% (50)	6.24% (47)	19.17% (48)	0.44% (34)
AG	1.88853 (14)	1,0000	0.57685 (15)	0.31168 (12)	0.88853 (14)	30.55% (15)	16.50% (12)	47.05% (14)	9.02% (03)
AH	1.43427 (33)	1,0000	0.31696 (31)	0.11731 (36)	0.43427 (33)	22.10% (30)	8.18% (37)	30.28% (33)	0.29% (45)
AI	1.36151 (39)	1,0000	0.25436 (38)	0.10716 (39)	0.36151 (39)	18.68% (38)	7.87% (40)	26.55% (39)	0.32% (42)
AJ	1.52343 (26)	1,0000	0.36675 (26)	0.15668 (26)	0.52343 (26)	24.07% (26)	10.28% (29)	34.36% (26)	0.81% (19)
AK	1.35858 (40)	1,0000	0.26452 (37)	0.09406 (44)	0.35858 (40)	19.47% (37)	6.92% (45)	26.39% (40)	0.59% (25)
AL	1.21296 (50)	1,0000	0.15838 (50)	0.05458 (51)	0.21296 (50)	13.06% (49)	4.50% (51)	17.56% (50)	1.64% (15)
AM	1.80130 (16)	1,0000	0.58242 (14)	0.21888 (20)	0.80130 (16)	32.33% (13)	12.15% (22)	44.48% (16)	0.51% (29)
AN	1.41178 (35)	1,0000	0.29756 (34)	0.11423 (37)	0.41178 (35)	21.08% (34)	8.09% (38)	29.17% (35)	0.29% (46)
AO	1.93195 (13)	1,0000	0.65823 (12)	0.27372 (14)	0.93195 (13)	34.07% (09)	14.17% (16)	48.24% (13)	0.17% (56)
AP	1.17453 (54)	1,0000	0.12259 (54)	0.05194 (53)	0.17453 (54)	10.44% (55)	4.42% (53)	14.86% (54)	2.85% (10)
AQ	1.74653 (17)	1,0000	0.51586 (16)	0.23067 (19)	0.74653 (17)	29.54% (16)	13.21% (19)	42.74% (17)	1.86% (13)
AR	1.20403 (52)	1,0000	0.15239 (51)	0.05163 (54)	0.20403 (52)	12.66% (51)	4.29% (54)	16.95% (52)	0.19% (52)
AS	1.44851 (29)	1,0000	0.31306 (32)	0.13545 (31)	0.44851 (29)	21.61% (32)	9.35% (31)	30.96% (29)	0.48% (31)
AT	1.32224 (44)	1,0000	0.23559 (42)	0.08665 (46)	0.32224 (44)	17.82% (42)	6.55% (46)	24.37% (44)	0.40% (36)
AU	1.96104 (12)	1,0000	0.68880 (10)	0.27223 (15)	0.96104 (12)	35.12% (06)	13.88% (18)	49.01% (12)	0.17% (55)
AV	1.07197 (57)	1,0000	0.05609 (57)	0.01588 (57)	0.07197 (57)	5.23% (57)	1.48% (58)	6.71% (57)	0.06% (59)
AW	3.03607 (03)	1,0000	1.36647 (03)	0.66960 (03)	2.03607 (03)	45.01% (03)	22.05% (05)	67.06% (03)	0.53% (27)
AX	1.30632 (46)	1,0000	0.22684 (45)	0.07948 (47)	0.30632 (46)	17.36% (43)	6.08% (48)	23.45% (46)	1.62% (16)
AY	1.11630 (56)	1,0000	0.08892 (56)	0.02739 (56)	0.11630 (56)	7.97% (56)	2.45% (56)	10.42% (56)	8.66% (04)
AZ	1.03193 (59)	1,0000	0.02527 (59)	0.00666 (59)	0.03193 (59)	2.45% (59)	0.64% (59)	3.09% (59)	8.14% (05)
BA	1.19219 (53)	1,0000	0.13926 (52)	0.05293 (52)	0.19219 (53)	11.68% (52)	4.44% (52)	16.12% (53)	5.22% (06)
BB	1.15696 (55)	1,0000	0.12107 (55)	0.03590 (55)	0.15696 (55)	10.46% (54)	3.10% (55)	13.57% (55)	0.72% (24)
BC	1.59675 (24)	1,0000	0.41298 (23)	0.18377 (24)	0.59675 (24)	25.86% (21)	11.51% (24)	37.37% (24)	0.77% (20)
BD	1.52453 (25)	1,0000	0.37891 (25)	0.14562 (30)	0.52453 (25)	24.85% (24)	9.55% (30)	34.41% (25)	0.48% (30)
BE	1.20992 (51)	1,0000	0.13711 (53)	0.07280 (49)	0.20992 (51)	11.33% (53)	6.02% (49)	17.35% (51)	0.47% (33)
BF	1.37477 (38)	1,0000	0.25239 (40)	0.12238 (33)	0.37477 (38)	18.36% (39)	8.90% (34)	27.26% (38)	0.24% (49)
BG	1.05185 (58)	1,0000	0.03605 (58)	0.01580 (58)	0.05185 (58)	3.43% (58)	1.50% (57)	4.93% (58)	2.71% (11)

1. Obtained by authors' calculations.
2. Numbers in parenthesis represent sectoral rankings.
3. The sectoral terminology of Hellenic Statistical Authority (with which the data have been published in Eurostat) was followed.

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