



Agricultural key sectors for EU-27: an approach

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Abstract

This paper analyses the agricultural economic structure of the European Union in 2000 using the Agricultural Social Accounting Matrices (Agrosams) developed by the European Commission (JRC-ITPS) where the agricultural sector is disaggregated into 40 sectors for each 27 Member States. It scrutinizes the potential key sectors of these economies, i.e. those which can generate more income than the average sector in the economy and responds more to shocks than the average sector. It divides the EU-27 Agrosams in different clusters – answering to the GDP per capita in relative terms – in order to identify potential key sectors for each cluster.

Key words: Social accounting matrix, key sector analysis, agriculture sectors, European Union.

Introduction

Social accounting matrixes (SAMs) are databases that encompass economic transactions which enable to extract information on the economic agents such as the producers, the consumers, the government and the foreign sector; as well as on the productive factors. The origin of the SAM relies on the attempt to integrate social statistics into productive sector's interdependence. Thus a SAM is an extension of an input-output table (IOT).

The IOT allows a structural analysis of the composition of the economy and the production system as a whole. This analysis, although in a static form in each period, can be performed in several successive periods of time, so one can consider evolutionary comparative statics, very close to economic dynamics.

The interest of SAMs is on the one hand, to reflect the situation of an economy in a particular year, it is a snapshot of an economy. On the other hand, the SAM is also used as a database for economic modelling (SAM linear models and General Equilibrium Models) to assess the socioeconomic impact of different economic policies. On top of their great statistical content, the SAMs have also become a useful tool for the impact assessment of policy interventions in national or regional frameworks.

The aim of this paper is to analyze the agricultural economic structure of the European Union (EU) in 2000 using the Agricultural Social Accounting Matrices (Agrosams) and the SIMSIPSAM software¹. Potential key sectors are identified, i.e. those which can generate more income than the average sector in the economy and respond more to shocks than the average sector.

Methodology

SAM structure is flexible and can take different forms depending on the motivation to use them. For example, depending on the model that will use the SAM, the last will be disaggregated in a

specific way, one needs to choose the sectoral and factor disaggregation, where greater emphasis is placed on those accounts that will be analyzed, in this case the agriculture sector.

The use of SAMs was initiated by Stone² who published a SAM for the United Kingdom in 1960. Since then, SAMs were built up for developing countries with the aim to implement programs that posed poverty reduction for these countries. Among others, one must highlight the SAM for Sri Lanka³ which induced an impulse in the field and its applications, with special reference to multiplier analysis⁴. Later, analyses were conducted for Botswana⁵, Korea⁶ and Indonesia⁷.

Through this methodology, one can identify the structural relationships of an economy leading to a comprehensive understanding of its respective economic performance. For this purpose, one can derive a hierarchy of the agricultural economic sectors with the calculation of two types of indexes: a *backward linkage* (BL) and a *forward linkage* (FL), both traditionally obtained from a symmetrical input-output table (SIOT).

The BL considers the effect of a change in the final demand of a specific sector on the economy's total production, whereas the FL values the effect of a joint change in the final demand of all sectors on the production of a specific sector.

The methodology developed by Rasmussen⁸ to obtain the BL, and that of Augustinovic⁹ to obtain the FL, are now considered traditional methods.^a More precisely, for the BL we suggest the database to be a SAM and not a SIOT (supply input-output table). This SAM should have a high degree of endogenization

^a One may also highlight BL and FL analysis done by Chenery and Watanabe¹¹ and Hirschman¹².

of the institutional sectors, so that the circular flow of income can be adequately closed. At least, the productive factors (labour and capital) and the households should be endogenized. This way, when analyzing the BL, not only the change in the final demand of a certain sector will reflect how the rest of the sectors change in order to “supply” the alteration in the final demand, but also, since the productive activity will increase, the factors remuneration and the consumers’ expenditure will as well increase, thus influencing again the productive sectors in a “second round”.

The method proposed by Rasmussen ⁸, uses the inverse matrix associated $B_i = (I - A_i)^{-1}$, where A_i is the technical coefficients matrix and I the identity matrix of size n , then we obtain the expression of the BL:

$$B_{.j} = \sum_{i=1}^n b_{ij} \quad j = 1 \dots n \quad (1)$$

where b_{ij} denotes the elements of the inverse matrix associated B_i and sub-indexes i, j make reference, respectively, to the rows and columns of the corresponding matrix.

Once this indicator is normalized, the interpretation of these coefficients is as follows: if the backward linkage is above one (BL_j greater than 100% in percentage terms), a unit change in the final demand of sector j will generate an increase above the average in the economy’s global activity.

Jones ¹⁰ stated that obtaining the FL as defined by Rasmussen did not have the quality of being a symmetrical measure in relation to the BL. Adopting a similar perspective, Augustinovic ⁹ had already defined the FL obtaining as the row sum of the Goshiana inverse, where the distribution coefficients δ_{ij} – obtained from the SIOT through dividing each cell by the row total, not the column total – replace the technical coefficients. This way, FL is calculated as O_i :

$$O_i = \sum_{j=1}^n \delta_{ij} \quad i = 1 \dots n \quad (2)$$

Thus we can value the joint effect of altering the supply of primary inputs in a particular sector on all sectors. Again, after its normalization, if the FL is above one (FL_i greater than 100% in percentages terms), a unit change in all sectors, will generate an increase above the average in sector i .

The Databases

The aim of this paper is to analyze the agricultural economic structure of the European Union. For this reason it relies in the AgroSAMs, which are a set of SAMs for the EU-27 with a highly disaggregated agricultural sector ¹³ for the year 2000. Normally, in national accounts, the agricultural sector is represented as a single account. This coarse representation is an important reason for the limited application of SAMs for the analysis of agricultural related policies.

The AgroSAMs were constructed based on 2000 Supply and Use Tables provided by EuroStat. At the same time, the agricultural sector has been comprehensively covered by integrating the database from the partial equilibrium agro-economic simulation model “Common Agricultural Policy Regionalized Impacts analysis modeling system” (CAPRI) ¹⁴. From these two main databases, Müller *et al.* ¹³ compiled a SAM for each Member State covering agricultural and non-agricultural activities and commodities. This dataset permits a level of analysis which is much more detailed than former existing databases. In order to give an example, in the

GTAP database, which is by large the most used database for CGE global analysis, distinguishes 12 raw agricultural products and 8 processed food commodities. Currently, the AgroSAM database contains 28 raw agricultural sectors and 1 processed food sectors and an agricultural service per each member state. All the AgroSAMs contain 98 activities and 97 commodities.^bThe non-agricultural sectors are disaggregated according to the NACE^c 1 classification.

The AgroSAMs have been built by following three main steps. First, the compilation of the consolidated macroeconomic indicators for EU-27. Second, the combination of different datasets from EuroStat into a set of SAMs with aggregated agricultural and food-industry sectors. Third, sectoral disaggregation following the CAPRI database.

The comparison of the activity accounts built on top of the CAPRI database and ESA^d databases revealed that, despite some relevant differences in coverage and definition, the CAPRI database can be considered a reliable source of information. Particularly, the most reliable values are the quantities of agricultural goods produced and traded, the activity levels, output and input coefficients and basic prices. Next, the CAPRI and the EuroStat database, both expressed in a SAM structure, were merged. The a-priori SAM has been populated following a compilation procedure that is fully documented in Müller *et al.* ¹³.

At the end of each of these three stages, the datasets were balanced. The method used drew heavily on the concept of Cross Entropy estimation. The structural deviations of agricultural sector and economy-wide data created a need to specify in which cases comparatively large deviations from recorded agricultural data could be tolerated, and in which cases not. For this purpose, Cross Entropy procedures proved to be extremely useful. The final matrixes then were balanced through a cross-entropy approach, combined with a multiplicative disturbance term. The balancing process was constrained by the ESA totals and the CAPRI totals.

Some Results for EU-27 Agricultural Potential Key Sectors

In this section, we present the main results obtained from the analysis of agricultural backward and forward linkages. To do so, we identify 4 different European clusters (Table 1) – answering to the GDP per capita in relative terms –. This will help identify the agriculture accounts in terms of potential key sectors for each cluster.

As defined previously, a key sector has both backward and forward linkages greater than 1. This means that the sector can generate more income than the average sector in the economy, and responds more to shocks than the average sector. In this case we will use *potential* key sectors, i.e. sectors which have a backward linkage (BL) greater than 1 and a forward linkage lesser than 1. Thus an increase in the forward linkage would make the sector a key sector.

Tables 2 to 5 present potential agricultural key sectors for the countries in each category. It is worth highlight that many of these countries share many of the sectors classified as potential key sectors.

^b The activity SETA Set aside does not produce any commodity.

^c Classification of Economic Activities in the European Community

^d European system of national accounts

Table 1. EU-27 categories based on GDP per capita.

Countries Categories / Year	2000 Euro Pc	2000 Index (EU-27=100)
Index >160 Category 1		
Luxembourg	50.400	301
Denmark	32.500	194
Sweden	30.200	180
Ireland	27.800	166
United Kingdom	27.200	162
160>Index>100 Category 2		
Netherlands	26.300	157
Austria	26.000	155
Finland	25.500	152
Germany	24.900	149
Belgium	24.600	147
France	23.700	142
Italy	21.000	125
European Union (27 countries)	16.748	100
100>Index>60 Category 3		
Spain	15.600	93
Cyprus	14.300	85
Portugal	12.500	75
Greece	12.600	75
Malta	11.000	66
Slovenia	10.800	64
Index < 60 Category 4		
Czech Republic	6.200	37
Poland	4.900	29
Hungary	4.900	29
Estonia	4.500	27
Slovakia	4.100	24
Latvia	3.600	21
Lithuania	3.600	21
Romania	1.800	11
Bulgaria	1.700	10

Source: Own elaboration from EUROSTAT.

Within Category 1, production of other animals, live, and their products (C_OANM) is the only agricultural sector which is a potential key sector for each (five) countries. Removing Luxembourg, there are nine sectors which are potential key sectors for each (remaining four) countries: production of poultry, live (C_PLTR), other crop production activities (C_OTCR), production of swine live (C_PIGF), production of sheep, goats, horses, asses, mules and hinnies, live (C_LSGE), production of raw milk from bovine cattle (C_COMI), production of barley (C_BARL), production of sugar beet (C_SUGB), production of bovine cattle, live (C_LCAT), and production of eggs (C_EGGS).

Within Category 2, there are four sectors which are potential key sectors for each (seven) countries: production of raw milk from bovine cattle (C_COMI), production of fodder crops (C_FODD), production of live plants (C_LPLT), and production of poultry, live (C_PLTR).

Within Category 3, production of other animals, live, and their products (C_OANM) is the only agricultural sector which is a potential key sector for each (six) countries. Nevertheless there are five sectors which are potential key sectors for 5 out of 6 countries of the category: Production of raw milk from bovine

Table 2. Potential agricultural key sectors, Category 1.

Luxembourg	Denmark	Sweden	Ireland	United Kingdom
C_SGMI	C_PLTR	C_FODD	C_RAPE	C_LCAT
C_OANM	C_OTCR	C_OCER	C_COMI	C_OTCR
	C_PIGF	C_OTCR	C_LSGE	C_LSGE
	C_LSGE	C_PLTR	C_OANM	C_FIBR
	C_FODD	C_OANM	C_SUGB	C_OANM
	C_POUM	C_LSGE	C_BARL	C_COMI
	C_OANM	C_PIGF	C_OCER	C_PLTR
	C_LPLT	C_STPR	C_OTCR	C_LPLT
	C_COMI	C_LPLT	C_OOIL	C_SUGB
	C_BARL	C_BARL	C_SGMT	C_EGGS
	C_FIBR	C_POUM	C_PLTR	C_OCER
	C_LCAT	C_SUGB	C_PIGF	C_PIGF
	C_PORK	C_COMI	C_EGGS	C_BARL
	C_SUGB	C_LCAT	C_LCAT	C_OWHE
	C_OWHE	C_OWHE	C_DAIR	C_STPR
	C_STPR	C_EGGS	C_FODD	C_POUM
	C_DAIR	C_PORK	C_BFVL	C_RAPE
	C_OCER			C_BFVL
	C_POTA			
	C_SUGA			
	C_AGSV			
	C_EGGS			

Note: For specification of abbreviations, see Table A1 in Appendix. Source: Own elaboration.

cattle (C_COMI), production of fodder crops (C_FODD), production of live plants (C_LPLT), production of sheep, goats, horses, asses, mules and hinnies, live (C_LSGE), production of sheep, goats, horses, asses, mules and hinnies, live (C_SGMI), and production of poultry, live (C_PLTR).

Within Category 4, there are six sectors which are potential key sectors for each (nine) countries: production of live plants (C_LPLT), production of raw milk from bovine cattle (C_COMI), production of sugar beet (C_SUGB), production of other starch and protein plants (C_STPR), production of swine live (C_PIGF) and production of other animals, live, and their products (C_OANM).

Table 6 shows the potential agricultural key sectors within the EU-27 and the four categories. We can identify those sectors which are potential key sectors in the five groups, i.e. production of other cereals (C_OCER), production of sugar beet (C_SUGB), production of live plants (C_LPLT), production of raw milk from bovine cattle (C_COMI), production of swine live (C_PIGF), production of sheep, goats, horses, asses, mules and hinnies, live (C_LSGE), production of eggs (C_EGGS), production of poultry, live (C_PLTR) and production of other animals, live, and their products (C_OANM).

The sectors which are potential key sectors only for one group are production of meat of bovine animals, fresh, chilled, or frozen (C_BFVL), production of potatoes (C_POTA), production of grain maize (C_MAIZ), production of prepared animal feeds (C_ANFD), processing of sugar (C_SUGA), production of meat of swine, fresh, chilled, or frozen (C_PORK) and production of grapes (C_GRPS).

The sectors which are potential key sectors for no group are durum wheat (C_DWHE), rape seed (C_RAPE), sunflower seed (C_SUNF), soya seed (C_SOYA), fresh vegetables, fruit and nuts (C_FVEG), agricultural services (C_AGSV), rice, milled or husked (C_RICE), other food products (C_OFOD), vegetable oils and fats, crude and refined; oil-cake and other solid residues, of

Table 3. Potential agricultural key sectors, Category 2.

Netherlands	Austria	Finland	Belgium	Germany	France	Italy
C_OANM	C_OWHE	C_COMI	C_SUGB	C_OTCR	C_OANM	C_RAPE
C_FODD	C_OTCR	C_OTCR	C_SGMI	C_FODD	C_LCAT	C_SGMI
C_COMI	C_STPR	C_LCAT	C_LPLT	C_PLTR	C_OTCR	C_RICE
C_FIBR	C_OCER	C_STPR	C_OANM	C_SGMI	C_LPLT	C_OANM
C_LPLT	C_LPLT	C_PLTR	C_FIBR	C_LPLT	C_FIBR	C_OTCR
C_SUGB	C_FIBR	C_OANM	C_OTCR	C_OANM	C_PLTR	C_LPLT
C_PIGF	C_COMI	C_EGGS	C_COMI	C_LSGE	C_STPR	C_PARI
C_LCAT	C_LSGE	C_LPLT	C_PLTR	C_OCER	C_OCER	C_SUGB
C_POTA	C_PLTR	C_PIGF	C_FODD	C_COMI	C_LSGE	C_LSGE
C_PORK	C_SGMI	C_FIBR	C_POTA	C_LCAT	C_COMI	C_MAIZ
C_DAIR	C_BARL	C_LSGE	C_EGGS	C_SUGB	C_SGMI	C_OOIL
C_LSGE	C_RAPE	C_POTA	C_AGSV	C_STPR	C_EGGS	C_PIGF
C_PLTR	C_LCAT	C_POUM	C_BFVL	C_BARL	C_OWHE	C_GRPS
C_SUGA	C_FODD	C_FODD	C_LSGE	C_POTA	C_SUGB	C_ANFD
C_EGGS	C_PIGF	C_DAIR		C_OWHE	C_PARI	C_COMI
	C_POTA	C_BARL		C_PIGF	C_FODD	C_EGGS
	C_BFVL				C_POUM	C_OCER
	C_SUGB				C_SUNF	C_PLTR
	C_EGGS				C_RAPE	C_FODD
					C_PIGF	C_SUNF

Note: For specification of abbreviations, see Table A1 in Appendix. Source: Own elaboration.

Table 4. Potential agricultural key sectors, Category 3.

Spain	Cyprus	Portugal	Greece	Malta	Slovenia
C_BARL	C_OOIL	C_OCER	C_DWHE	C_OWHE	C_OOIL
C_RAPE	C_POTA	C_PARI	C_PARI	C_FODD	C_POTA
C_OOIL	C_FVEG	C_POTA	C_OOIL	C_COMI	C_SUGB
C_SUGB	C_LPLT	C_SUGB	C_POTA	C_SGMI	C_LPLT
C_FIBR	C_FODD	C_OTCR	C_SUGB	C_LSGE	C_FODD
C_OTCR	C_COMI	C_LPLT	C_FIBR	C_PLTR	C_COMI
C_LPLT	C_LCAT	C_FODD	C_GRPS	C_OANM	C_LCAT
C_COMI	C_PIGF	C_COMI	C_FVEG	C_PORK	C_PIGF
C_LCAT	C_EGGS	C_SGMI	C_LPLT	C_SGMT	C_SGMI
C_PIGF	C_OANM	C_LSGE	C_FODD	C_POUM	C_LSGE
C_SGMI	C_PORK	C_PLTR	C_PIGF		C_EGGS
C_LSGE	C_POUM	C_OANM	C_SGMI		C_PLTR
C_EGGS		C_POUM	C_LSGE		C_OANM
C_PLTR		C_BEVR	C_EGGS		C_BFVL
C_OANM			C_PLTR		C_POUM
C_SGMT			C_OANM		C_ANFD
C_POUM			C_RICE		
			C_VOIL		
			C_BEVR		
			C_ANFD		

Note: For specification of abbreviations, see Table A1 in Appendix. Source: Own elaboration.

vegetable fats or oils (C_VOIL), beverages (C_BEVR) and tobacco products (C_TOBA).

This descriptive analysis leads to three interesting remarks. First, one may highlight that each potential key sectors of the Category 2 – excepting production of potatoes (C_POTA) – are also potential key sectors for the EU-27. This category includes Netherlands, Austria, Finland, Belgium, Germany, France and Italy. Second, Category 3 is the only group which includes all EU-27 potential key sectors. This category includes Spain, Cyprus, Portugal, Greece, Malta and Slovenia. Third, Category 4 shares less potential key sectors with the EU-27 than all other categories,

i.e. 11 sectors. Category 1, 2 and 3 share with the EU-27, respectively, 14, 15 and 17 potential key sectors.

Figures 1 and 2 illustrate the classification of agricultural sectors in Europe according to their ability to influence and to be influenced. In the top-right key sectors are included, in the top-left forward oriented sectors, in the bottom-right backward oriented sectors and finally in the bottom-left weak sectors.

These figures clearly show that roughly half of the sectors can be classified as weak sectors, whereas the other half has positive backward linkages. In the appendix the Figures for each category are presented.

Table 5. Potential agricultural key sectors, Category 4.

Czech R.	Poland	Hungary	Estonia	Slovakia	Latvia	Lithuania	Romania	Bulgaria
C_LSGE	C_SGMT	C_COMI	C_SUGB	C_COMI	C_OANM	C_LSGE	C_SGMI	C_PARI
C_LPLT	C_SUGA	C_LPLT	C_SGMT	C_LPLT	C_LPLT	C_SUGB	C_LSGE	C_LPLT
C_SGMI	C_SGMI	C_OCER	C_LPLT	C_PIGF	C_OOIL	C_LPLT	C_LPLT	C_OCER
C_PLTR	C_STPR	C_MAIZ	C_OANM	C_SGMT	C_ANFD	C_SGMI	C_SGMT	C_COMI
C_EGGS	C_PIGF	C_SUGA	C_PIGF	C_OCER	C_SUGB	C_PIGF	C_OWHE	C_PIGF
C_COMI	C_OANM	C_PIGF	C_BFVL	C_LSGE	C_COMI	C_OANM	C_OCER	C_GRPS
C_OCER	C_LSGE	C_BARL	C_STPR	C_OANM	C_BEVR	C_COMI	C_STPR	C_OANM
C_OWHE	C_LPLT	C_OWHE	C_PLTR	C_SGMI	C_DAIR	C_STPR	C_PIGF	C_POTA
C_SUGB	C_PORK	C_OANM	C_LSGE	C_PORK	C_OFOD	C_SUGA	C_OANM	C_ANFD
C_POTA	C_PLTR	C_POTA	C_COMI	C_LCAT	C_PIGF	C_BFVL	C_FODD	C_DAIR
C_STPR	C_SUGB	C_EGGS	C_BARL	C_FODD	C_BFVL	C_FODD	C_EGGS	C_PLTR
C_FODD	C_DAIR	C_FODD	C_DAIR	C_EGGS	C_PORK	C_PORK	C_PLTR	C_SUGB
C_PIGF	C_COMI	C_ANFD	C_ANFD	C_DAIR	C_SGMT	C_OCER	C_MAIZ	C_STPR
C_BARL	C_EGGS	C_POUM	C_PORK	C_STPR	C_OCER	C_OWHE	C_OOIL	C_OOIL
C_POUM	C_ANFD	C_STPR	C_SGMI	C_POTA	C_SUGA		C_COMI	C_PORK
C_OANM	C_OTCR	C_SGMI	C_LCAT	C_RAPE	C_EGGS		C_OTCR	C_EGGS
C_DAIR	C_LCAT	C_OTCR		C_SUGB	C_STPR		C_GRPS	C_BFVL
C_RAPE		C_SUGB		C_ANFD	C_OWHE		C_LCAT	
C_PORK		C_PLTR		C_SUNF	C_OTCR		C_SUNF	
		C_SUNF		C_PLTR			C_SUGB	
		C_PORK		C_BFVL			C_FVEG	
		C_VOIL		C_OWHE			C_BARL	
		C_DAIR		C_OTCR			C_POTA	
		C_RAPE					C_ANFD	
							C_BFVL	

Note: For specification of abbreviations, see Table A1 in Appendix. Source: Own elaboration.

Table 6. Potential agricultural key sectors.

SAM #	EU-27	SAM #	Category 1	SAM #	Category 2	SAM #	Category 3	SAM #	Category 4
3	C_BARL	1	C_OWHE	5	C_OCER	3	C_BARL	1	C_OWHE
5	C_OCER	3	C_BARL	6	C_PARI	5	C_OCER	4	C_MAIZ
6	C_PARI	5	C_OCER	12	C_POTA	6	C_PARI	5	C_OCER
10	C_OOIL	11	C_STPR	13	C_SUGB	10	C_OOIL	6	C_PARI
13	C_SUGB	13	C_SUGB	14	C_FIBR	13	C_SUGB	11	C_STPR
14	C_FIBR	14	C_FIBR	15	C_OTCR	14	C_FIBR	13	C_SUGB
15	C_OTCR	15	C_OTCR	18	C_LPLT	15	C_OTCR	18	C_LPLT
18	C_LPLT	18	C_LPLT	19	C_FODD	16	C_GRPS	20	C_COMI
19	C_FODD	19	C_FODD	20	C_COMI	18	C_LPLT	22	C_PIGF
20	C_COMI	20	C_COMI	21	C_LCAT	19	C_FODD	23	C_SGMI
21	C_LCAT	21	C_LCAT	22	C_PIGF	20	C_COMI	24	C_LSGE
22	C_PIGF	22	C_PIGF	23	C_SGMI	21	C_LCAT	25	C_EGGS
23	C_SGMI	24	C_LSGE	24	C_LSGE	22	C_PIGF	26	C_PLTR
24	C_LSGE	25	C_EGGS	25	C_EGGS	23	C_SGMI	27	C_OANM
25	C_EGGS	26	C_PLTR	26	C_PLTR	24	C_LSGE	38	C_SUGA
26	C_PLTR	27	C_OANM	27	C_OANM	25	C_EGGS	40	C_DAIR*
27	C_OANM	40	C_DAIR			26	C_PLTR	42	C_PORK
		41	C_BFVL			27	C_OANM	43	C_SGMT
		43	C_SGMT			43	C_SGMT	46	C_ANFD
		44	C_POUM			44	C_POUM		

* Key sector i.e. this sector has both backward and forward linkages greater than 1. Note: For definition of clusters, see Table 1; for specification of abbreviations, see Table A1 in Appendix. Source: Own elaboration.

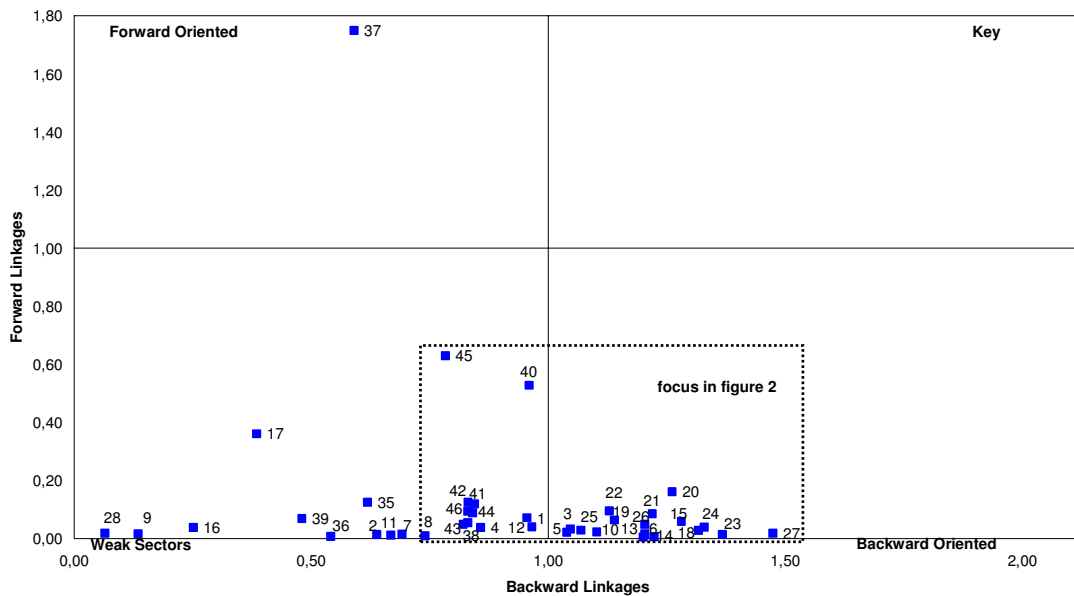


Figure 1. Weighted agricultural backward and forward linkages, Europe 2000.

Note: For specification of abbreviations, see Table A1 in Appendix. Source: Own elaboration.

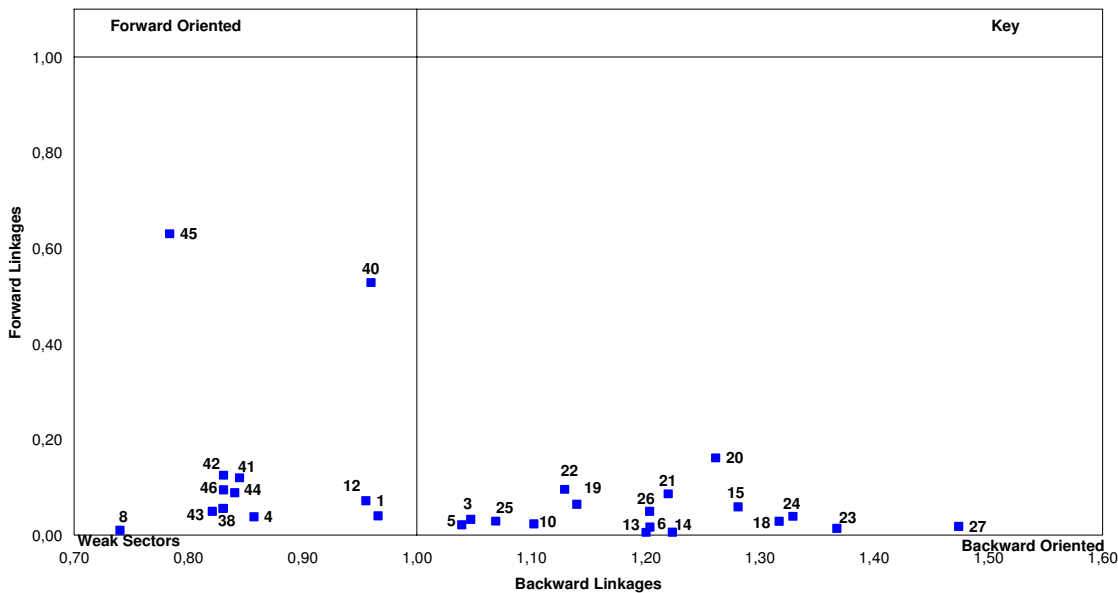


Figure 2. Weighted agricultural backward and forward linkages (focus), Europe 2000.

Note: For specification of abbreviations, see Table A1 in Appendix. Source: Own elaboration.

Concluding Remarks

This paper stresses the capacity of a Social Accounting Matrix (SAM) with a highly disaggregated agricultural sector (AgroSAM) to provide descriptive analysis of the European agricultural sector in 2000.^c The software SIMIPSAM is used to detect backward and forward structural linkages as well as potential key sectors. It makes possible a pan-EU mapping of those sectors which generate more income than the average sector in the economy and respond more to shocks than the average sector.

A first insight from the pan EU analysis sheds some light on the absence of agricultural key sector but recognizes many *potential*

key sectors. Livestock and related products (including fodder, milk and dairy products) present the highest backward linkages for most of the European clusters.

Therefore, the methodology used to detect agricultural key sectors appears to be adequate and provide a significant contribution as a tool for obtaining such information, which is important for the assessment of economic policies.

^c AgroSAMs are currently in updating process to the year 2007. Currently, the dataset is for the year 2000. Thus macroeconomic adjustments and policy changes occurred since 2000, notably 2003-2004-2008 CAP reforms, are not taken into account.

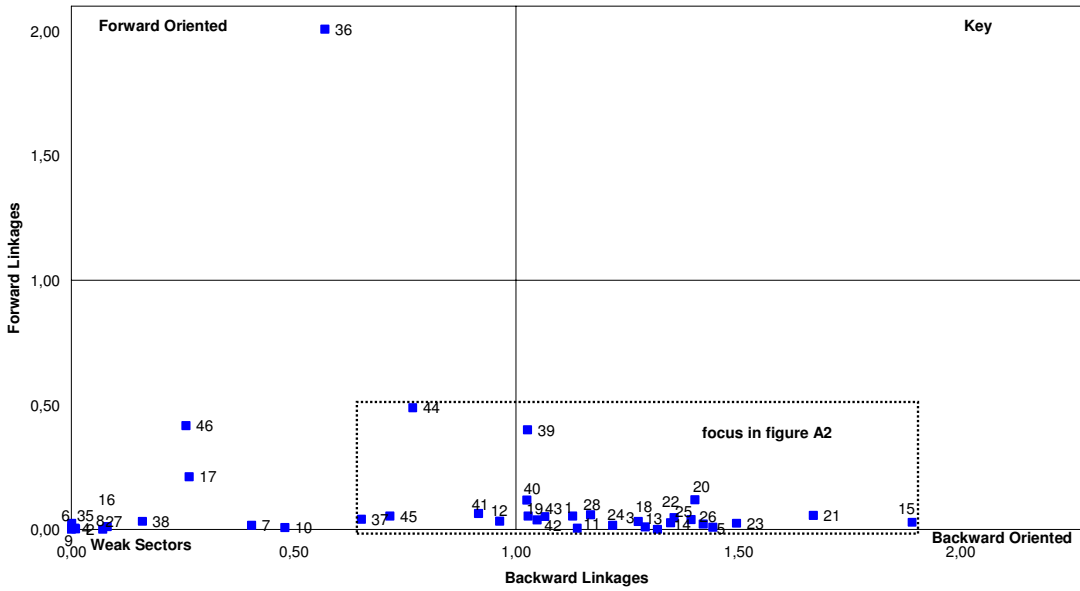
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Appendix Table A1. Agricultural classification for AgroSAM.

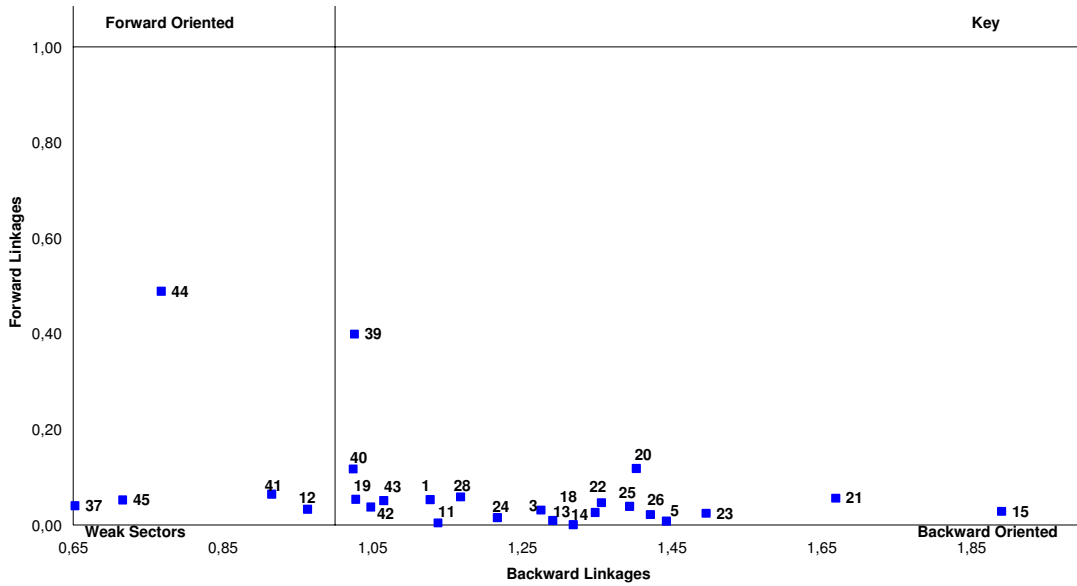
SAM #	Code	Description	SAM #	Code	Description
1	OWHE	Production of other wheat	21	LCAT	Production of bovine cattle, live
2	DWHE	Production of durum wheat	22	PIGF	Production of swine, live
3	BARL	Production of barley	23	SGMI	Production of raw milk from sheep and goats
4	MAIZ	Production of grain maize	24	LSGE	Production of sheep, goats, horses, asses, mules and hinnies, live
5	OCER	Production of other cereals	25	EGGS	Production of eggs
6	PARI	Production of paddy rice	26	PLTR	Production of poultry, live
7	RAPE	Production of rape seed	27	OANM	Production of other animals, live, and their products
8	SUNF	Production of sunflower seed	28	AGSV	Agricultural service activities
9	SOYA	Production of soya seed	36	RICE	Processing of rice, milled or husked
10	OOIL	Production of other oil plants	37	OFOD	Production of other food
11	STPR	Production of other starch and protein plants	38	SUGA	Processing of sugar
12	POTA	Production of potatoes	39	VOIL	Production of vegetable oils and fats, crude and refined; oil-cake and other solid residues, of vegetable fats or oils
13	SUGB	Production of sugar beet	40	DAIR	Dairy
14	FIBR	Production of fibre plants	41	BFVL	Production of meat of bovine animals, fresh, chilled, or frozen
15	OTCR	Other crop production activities	42	PORK	Production of meat of swine, fresh, chilled, or frozen
16	GRPS	Production of grapes	43	SGMT	Production of meat of sheep, goats, and equines, fresh, chilled, or frozen
17	FVEG	Production of fresh vegetables, fruit, and nuts	44	POUM	Meat and edible offal of poultry, fresh, chilled, or frozen
18	LPLT	Production of live plants	45	BEVR	Production of beverages
19	FODD	Production of fodder crops	46	ANFD	Production of prepared animal feeds
20	COMI	Production of raw milk from bovine cattle	47	TOBA	Tobacco products

Source: Own elaboration from Mueller *et al.* ¹³.



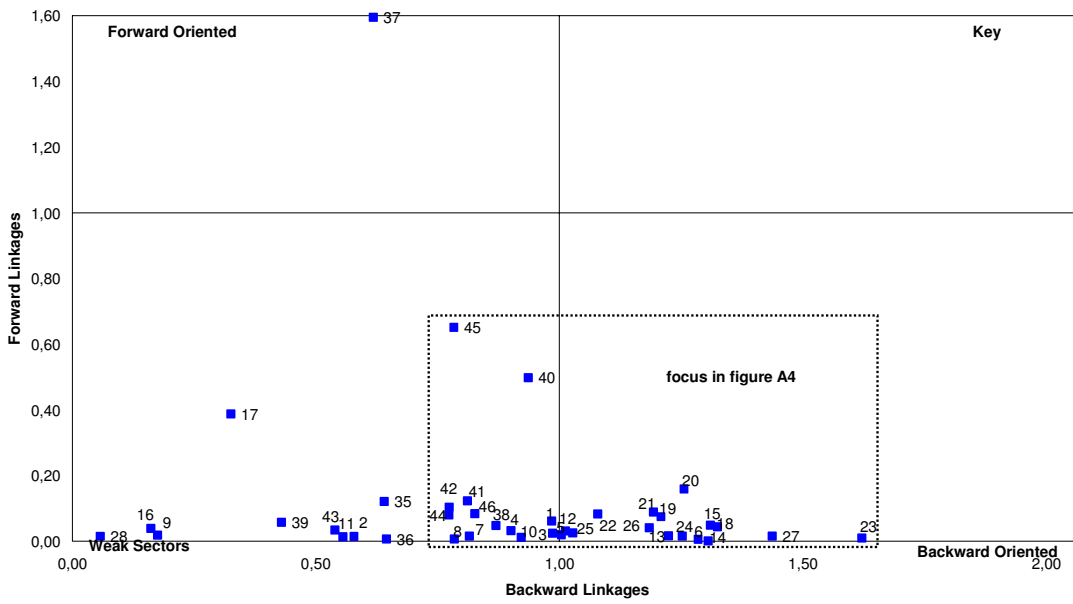
Appendix Figure A1. Weighted agricultural backward and forward linkages, Category 1 2000.

Note: For definition of cluster, see Table 1; for specification of abbreviations, see Table A1. Source: Own elaboration.



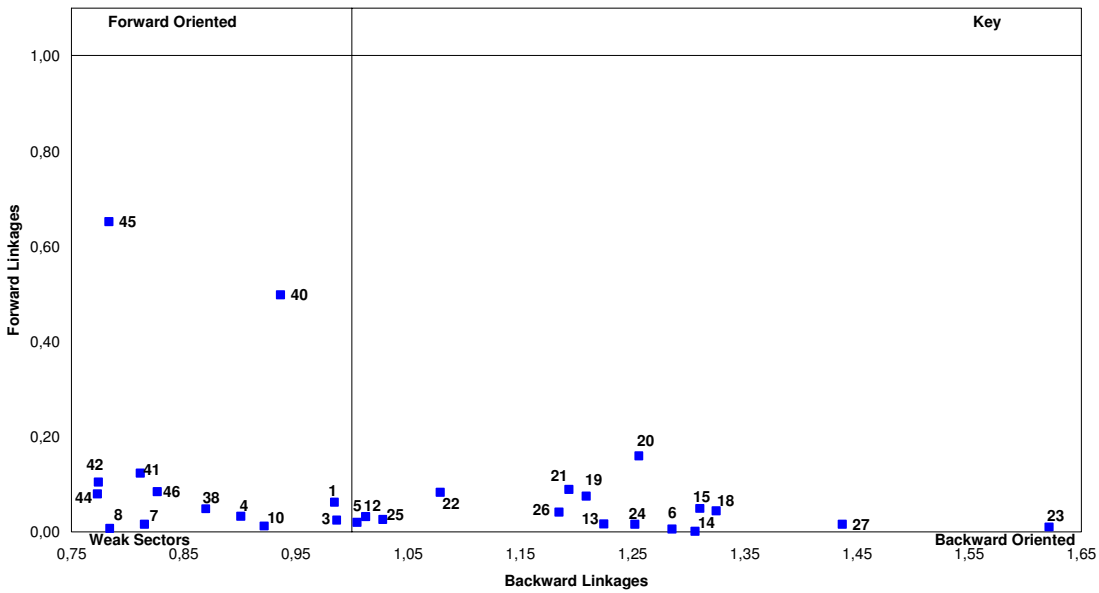
Appendix Figure A2. Weighted agricultural backward and forward linkages (focus), Category 1 2000.

Note: For definition of cluster, see Table 1; for specification of abbreviations, see Table A1. Source: Own elaboration.



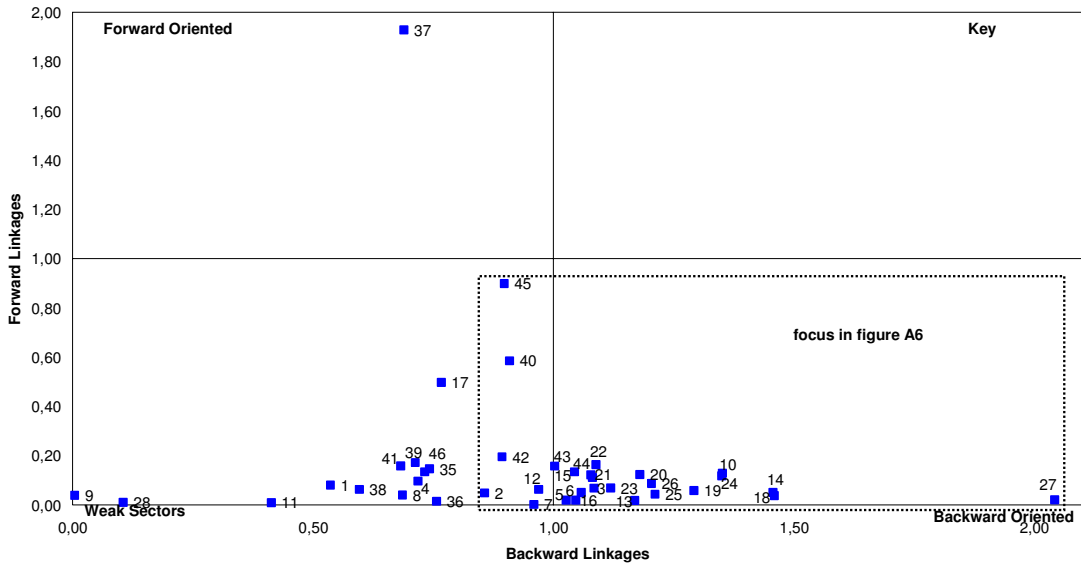
Appendix Figure A3. Weighted agricultural backward and forward linkages, Category 2 2000.

Note: For definition of cluster, see Table 1; for specification of abbreviations, see Table A1. Source: Own elaboration.



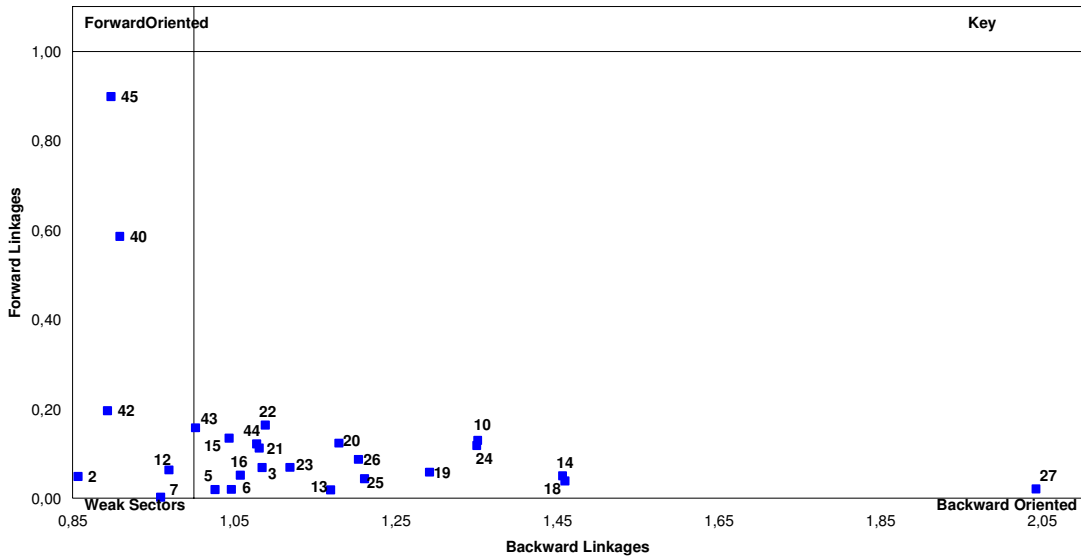
Appendix Figure A4. Weighted agricultural backward and forward linkages (focus), Category 2 2000.

Note: For definition of cluster, see Table 1; for specification of abbreviations, see Table A1. Source: Own elaboration.



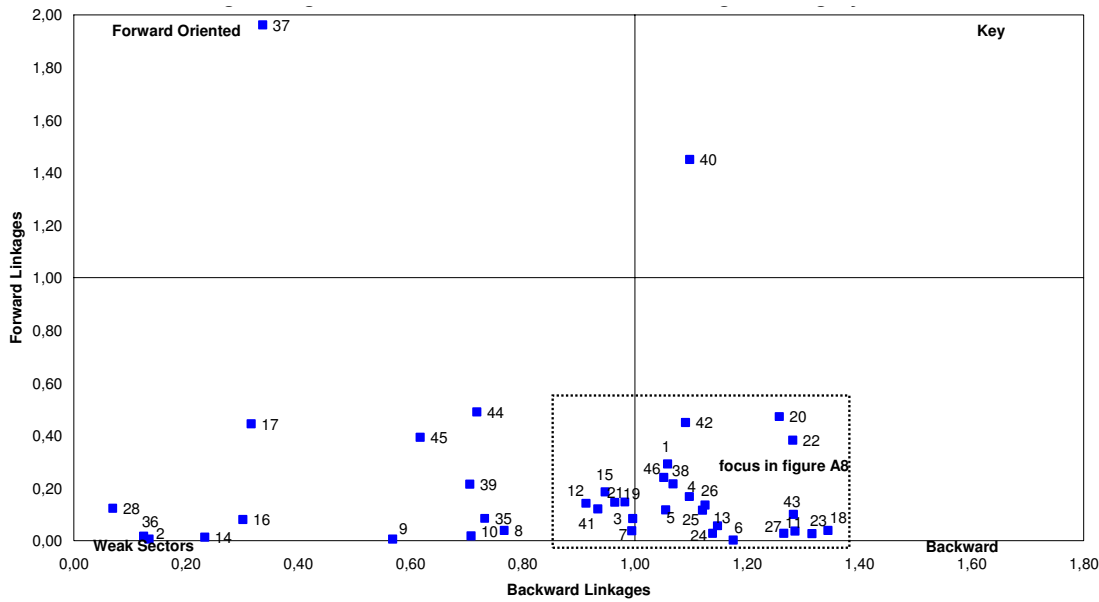
Appendix Figure A5. Weighted agricultural backward and forward linkages, Category 3 2000.

Note: For definition of cluster, see Table 1; for specification of abbreviations, see Table A1. Source: Own elaboration.



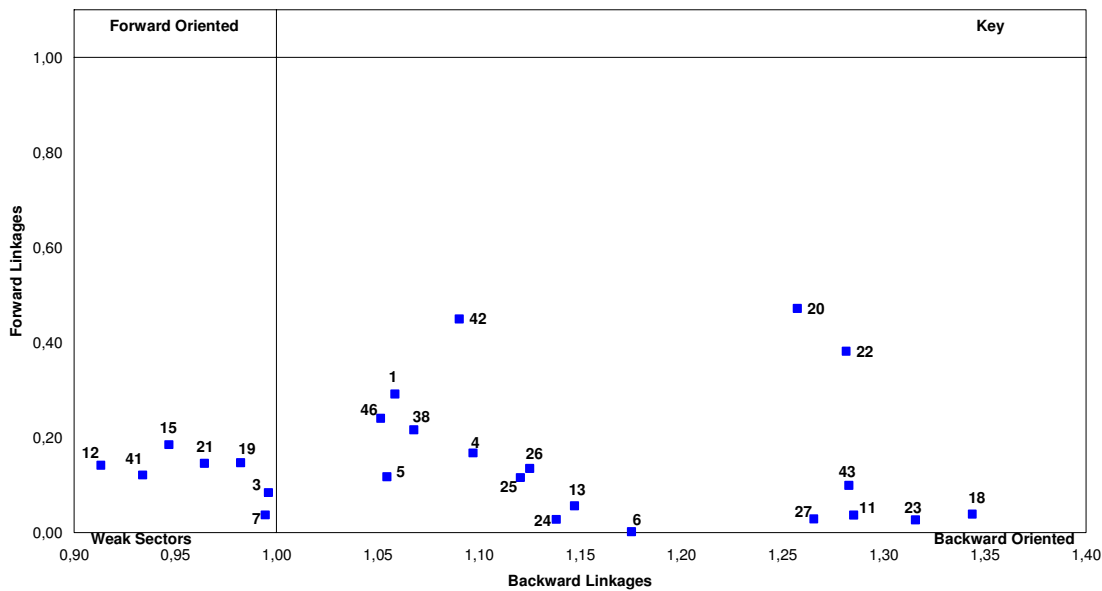
Appendix Figure A6. Weighted agricultural backward and forward linkages (focus), Category 3 2000.

Note: For definition of cluster, see Table 1; for specification of abbreviations, see Table A1. Source: Own elaboration.



Appendix Figure A7. Weighted agricultural backward and forward linkages, Category 4 2000.

Note: For definition of cluster, see Table 1; for specification of abbreviations, see Table A1. Source: Own elaboration.



Appendix Figure A8. Weighted agricultural backward and forward linkages (focus), Category 4 2000.

Note: For definition of cluster, see Table 1; for specification of abbreviations, see Table A1. Source: Own elaboration.