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EUROSISTEMA

Questioni di Economia e Finanza

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AN INTEGRATED DATASET OF ITALIAN FIRMS: 2005-2014

by Corrado C. Abbate*, Maria G. Ladu** and Andrea Linarello***

Abstract

In this paper we describe the steps followed to build a new dataset covering the universe of active private non-financial firms in Italy between 2005 and 2014. The dataset is the outcome of collaboration between the Bank of Italy and the Italian National Statistical Agency and was constructed using statistical, administrative and fiscal sources. It contains information on firms' location, legal form, date of incorporation, industry classification, workforce, turnover and value added and is suitable for studying the evolution of Italian production sectors since the mid-2000s.

Contents

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1. Introduction[1]

In many countries the increased availability of micro data on the universe of firms has contributed substantially to the understanding of productivity and industry dynamics. Italy is among the countries in which empirical analyses have been based exclusively on sub-samples of firms, typically incorporated (e.g. ORBIS) or large firms, as there is no long panel covering the universe of firms, i.e. irrespective of legal form or firm size.

In this paper we describe the construction of a new dataset for the universe of Italian firms operating in the non-farm and non-financial business sectors in the period 2005-2014. This is the outcome of a collaboration between the Bank of Italy and the Italian National Statistical Agency (Istat). The dataset combines information from statistical, administrative and fiscal sources. The construction relies heavily on work done at Istat over the past few years to build the FRAME-SBS dataset, an integrated firm-level dataset covering all firms active for at least 6 months in a given business year. The FRAME-SBS is the source of information for our dataset starting from 2012. The joint efforts of the Bank and Istat filled the gaps backwards and built a longer time series of data suitable for studying the evolution of the Italian economy since 2005 and especially during the global financial and sovereign debt crises.

The dataset contains information on firms' location, legal form, date of incorporation, industry classification (NACE), number of persons employed, turnover and value added. As such it is suitable for investigating labour productivity dynamics, i.e. value added per worker, at the firm and industry level; it can be used to explore the evolution of entry and exit rates and the contribution of firm demography to aggregate outcomes, and to describe the evolution of the Italian economy through the lens of firm heterogeneity by age, size and location. Although it is an extremely valuable source of information, it does have some limitations. First, for most firms information on investment and capital is not available in fiscal sources; we are therefore unable to measure capital stock, which is crucial to estimate a production function and retrieve a firm-level measure of total factor productivity. Second, the lack of more detailed firm-level information on other economic variables, such as the type of products or the skill composition of the labour force, makes it impossible to study some interesting issues that have recently been proposed as the main explanations of productivity dynamics in other countries.

The rest of the paper is organized as follows. Section 2 describes the main source of information used to build the dataset, while Section 3 details the procedures followed to build the dataset. Section 4 presents some descriptive statistics. Finally, in Section 5 we discuss some consistency checks relating to our data.

2. Data source

In order to build the dataset we use information from several sources:
1. business register (ASIA);
2. balance sheet of incorporated firms (CERVED);
3. fiscal authority survey (Sectoral studies);
4. survey on economic and financial accounts (SCI);

5. income tax return (Modello Unico).

The starting point of our dataset construction is the definition of the universe of firms. When a company starts, it registers at the Chamber of Commerce (COC). This results in a so called "legal unit". The government raises different types of taxes (value added tax, corporate tax, income tax) from these "companies". Depending on the tax legislation, the corresponding tax units may be composed of one or more legal units of the COC, and they may also differ for each type of tax. The ASIA data handle these different unit types and contain all enterprises carrying on economic activities contributing to gross domestic product in the fields of industry, commerce and services and that are active for at least 6 months. ASIA provides us the firms identification (name, address, date of creation),the number of employed persons, the legal form, the economic activity (NACE code) and firms' revenues. The Business Register is yearly updated through a process of integration of administrative and statistical sources. After having defined the population of enterprises, we recover economic variables such as value added and labor costs combining information coming from different sources.

The first source of economic information is the annual balance sheet data of all incorporated firms. According to Italian legislation all incorporated firms must fill annual reports which are deposited to the COCs and subsequently collected by CERVED Group, a private company that performs some controls and consistency checks.

The second important source of data is the tax revenue sources (Sectoral Studies). All enterprises are obliged to declare their taxable income to the Fiscal Authority by filling in tax forms. Based on their legal form and the accountancy regime, enterprises have to fill in different types of tax forms. The Sectoral Studies (Fiscal Authority Survey) is a fiscal survey aiming to evaluate the capacity of enterprises to produce income and to know whether they pay taxes correctly. In spite of some exclusion and non-enforceability principles, almost all enterprises are obliged by law to fill in the Sectoral Studies survey questionnaire together with the tax return one and to declare in detail costs and income items. As the common part of all sectoral studies questionnaires for the manufacturing and the service sector (Sectoral Study F) is like a balance sheet, it can be used to recover turnover, value added and labor costs. The availability of information is more limited for questionnaires filled by professional activities (Sectoral Study G), nonetheless they represent an invaluable source of economic information for a large number of enterprises.

The third source of data is the survey conducted by ISTAT on economic and financial accounts of large enterprises that covers all enterprises operating in Italy with at least 100 employed persons and concerns all enterprises of industrial and services sectors excluding financial services. The survey collects data concerning profit-and-loss accounts and balance sheets data.

Finally, since 2011 we use also information on annual income tax return (Modello Unico). In particular, we use this source of data to recover information for those enterprises that, despite been active, have no economic information available from all previous sources. This is often the case for micro enterprises subject to special tax regimes (Regime dei Minimi), those firms are subject to flat tax rate of 5 per cent, in the first 5 years of business if their turnover is lower than 30.000 euros.

The construction of the dataset starts with the definition of the universe of active firms using the business registry. Later, in order to construct the economic variables we follow a hierarchical approach in the use of the different data sources: first, we use balance sheets whenever available; second, we use the sectoral study for manufacturing and services (Sectoral Study F); third, we use the sectoral study for professional activities (Sectoral Study G); finally, we use the tax returns to complement our data. Once we recover information from all these sources, we are left with a few large enterprises with missing information; for those firms we use the account data coming from the survey on economic and financial accounts of large enterprises (SCI).

3. Procedures implemented to build the dataset

3.1 Variables description

Table 1 reports the definition and the availability of the main economic variables used for the construction of the data set by source. Balance sheets (CERVED) and the survey on economic and financial accounts (SCI) provide information on all economic variables needed to compute value added. The level of detail of information differs between sectoral studies filled by firms operating in the manufacturing and the services sectors (F) and those filled by professional activities (G). The latter, despite been characterized by a smaller number of information, is nonetheless suited to measure turnover, production costs and value added for these particular types of activities. Tax returns are the least accurate source of information: they provide information only on turnover and purchases of goods and services, thus it is used only when all other sources of data are not available.

3.2 Industry classification standards over time

For each firm in our data, the business registry reports the main industry classification at 5-digit level of disaggregation. Up to 2007 the available classification was NACE rev 1.1, while starting in 2008 the official classification changed to NACE rev 2. In order to assign to each firm an industry classification according to the NACE rev. 2 we proceed as follows. First, for all firms that we observe both before and after the change in the NACE classification, we assign the industry classification that we observed after 2008. This procedure, however, does not allow us to classify all firms using the NACE rev. 2 classification, because there are firms that we observe only before 2008. For the remaining firms we build a correspondence table between the two classifications using the information available in the business registry. In 2008, the first year of the new classification, the business registry reports for each firm both classifications; we build a unique correspondence between the two classifications by assigning to each industry code Nace rev. 1.1 a unique industry code Nace rev. 2 using, whenever more correspondence are available, the industry with the largest employment share.

3.3 Imputation description

Although the rich sources of information used to build our dataset, we are not able, unless very recent years, to measure value added for all active firms. The main reason behind the unavailability of value added for some firms prior to 2012 is the lack of the full set of tax returns. Despite the lack of information, the aim of this work is to build a dataset which covers the universe of active firms as defined in the business registry, therefore we implemented an imputation procedure. For all firms with missing value added before 2012, we use the median value added per worker within cells defined by industry classification, size class, location and legal form. This method has the advantage to exploit a rich set of available information at firm level to infer value added, moreover all these variables have been proven to be correlated with productivity and hence value added. In section 5 we will provide some evidence that such imputation procedure does not affect the reliability of our results.

Table 1 - Variable description

		Balance sheet	Sector study		SCI	Tax Record	Frame
			F	G			
A1	Turnover	X	X	X	X	X	X
A2	Change in stock of finished goods	X	X		X		X
A3	Change in stock of work in progress	X	X		X		X
A4	Capitalized production	X	X		X		X
A5	Other income	X	X	X	X		X
A	**Production value**						A1+A2+A3+A4+A5
B6	Purchases of goods	X	X	X	X	X	X
B7	Purchases of services	X	X	X	X	X	X
B8	Other operating costs	X	X		X		X
B9	Change in stock of row materials	X	X		X		X
B10	Other operating charges	X	X	X	X		X
B	**Production costs**						B6+B7+B8+B9+B10
	Value added						(A1+A2+A3+A4+A5)-(B6+B7+B8+B9+B10)

4. Data description

This section presents some descriptive statistics about the number of firms, employed persons, revenue and value added for firms included in our dataset.

4.1 Firms

Table 2 shows the number of firms by year and firm size: micro (1-9), small (10-49), medium (50-249) and large (250+). As it is well known, micro firms represent a large share, about 95 percent, of total firms in the Italian economy. Table 3 shows the number of firms by year and sector. The highest number of firms operate in the trade sector, followed by the professional one.

4.2 Employed Persons

Table 4 shows the average number of employed persons by year and firm size. While the number of employed persons by micro, small and medium firms is constant during the time period considered, large firms increased average size by almost 10 units between 2005 and 2014.

In Table 5 we report the average number of workers by year and sector. Number of employed persons is the highest in the manufacturing and the lowest in the professional sector.

Table 2 - Number of firms by year and size

Year	Micro[a]	Small[b]	Medium[c]	Large[d]	Total
2005	4087862	181774	21382	3196	4294214
2006	4121302	183629	21867	3305	4330103
2007	4182007	191962	22204	3387	4399560
2008	4204756	197647	22545	3482	4428430
2009	4164498	188803	22021	3470	4378792
2010	4158683	183367	21454	3476	4366980
2011	4148431	181622	21942	3421	4355416
2012	4144876	178023	21683	3393	4347975
2013	4100202	171423	21440	3402	4296467
2014	4073415	165819	21212	3397	4263843

(a) Micro: 1-9 employees; (b)Small: 10-49 employees; (c)Medium: 50-249 employees;   (d)Large: 250+ employees

Table 3 - Number of firms by year and sector

Sector[a]	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
B	2853	2770	2739	2692	2555	2504	2493	2407	2349	2250
C	459760	453447	448209	444812	429190	419126	419523	412731	405303	396401
D	2445	2617	2912	3300	3679	4730	7090	9363	10315	10459
E	8663	8665	8712	8895	8783	8923	9055	9089	9208	9146
F	588740	599881	622318	631840	619933	604250	588120	570746	549444	529103
G	1233385	1225729	1223292	1208788	1179847	1170089	1168265	1159875	1151821	1123133
H	148084	145433	142348	142928	137421	134769	133568	131668	129741	125686
I	274523	278156	283494	291708	289655	294596	304985	309335	314271	312013
J	94075	95526	96324	96485	94885	95477	95627	95889	95348	96997
L	226447	232776	238482	236890	238874	241335	243981	244277	245870	239134
M	625620	644623	682517	700397	707866	715063	695592	707541	689185	705895
N	133874	134168	137990	138400	141171	142057	141541	140851	138705	139895
P	238768	247302	248024	257157	263723	271503	280943	287567	289322	306382
R	57133	58743	60963	62352	61664	62077	61613	62911	63043	64169
S	199844	200267	201236	201786	199546	199802	202676	203725	202542	203180

a) See Appendix A for sector description

Table 4 – Average Number of workers per firm by year and by size (headcounts)

Year	Micro[a]	Small[b]	Medium[c]	Large[d]
2005	1.92	18.26	95.42	925.94
2006	1.93	18.27	95.72	929.55
2007	1.95	18.33	96.57	926.24
2008	1.96	18.31	96.12	920.56
2009	1.95	18.24	96.37	914.08
2010	1.95	18.23	96.06	913.68
2011	1.96	18.31	95.25	916.54
2012	1.95	18.34	95.54	919.84
2013	1.94	18.34	95.80	917.53
2014	1.92	18.40	96.33	927.19

a; b; c; d: see notes on table 2

Table 5 – Average Number of workers per firm by year and sector (headcounts)

Sector[a]	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
B	13.17	13.71	14.11	14.44	14.65	14.4	14.53	14.35	14.63	15.02
C	9.06	9.16	9.37	9.46	9.37	9.3	9.33	9.31	9.28	9.34
D	37.62	34.68	30.69	26.11	23.64	18.65	12.85	9.96	9.15	9.13
E	18.01	18.88	19.57	19.85	20.55	20.52	20.36	20.62	20.31	20.43
F	3.06	3.09	3.17	3.16	3.06	3	2.94	2.85	2.76	2.7
G	2.7	2.77	2.85	2.91	2.96	2.98	3.01	3.02	2.99	3
H	7.3	7.55	7.88	8.01	8.13	8.23	8.39	8.44	8.45	8.69
I	3.87	3.97	4.15	4.24	4.24	4.25	4.26	4.36	4.24	4.23
J	5.58	5.59	5.65	5.75	5.96	5.86	5.87	5.89	5.86	5.72
L	2.56	2.44	2.34	2.24	2.08	1.92	1.75	1.65	1.55	1.48
M	1.81	1.8	1.78	1.78	1.77	1.75	1.76	1.74	1.76	1.73
N	7.33	7.73	7.68	8.04	7.71	7.74	7.92	7.91	8.08	8.22
P	2.79	2.84	2.92	2.97	3.01	3.02	2.94	3.01	3.08	2.96
R	2.55	2.58	2.62	2.68	2.72	2.74	2.77	2.82	2.82	2.73
S	2.11	2.15	2.18	2.23	2.25	2.25	2.23	2.25	2.25	2.25

a) See note on table 3

4.3 Revenues

Table 6 presents the distribution of average revenues by year and firm size. As expected, revenue is higher for large firms compared with the other size classes. Table 7 shows the distribution of revenue by year and sector. Firms in the manufacturing sector have the highest average revenues.

Table 6. Average Revenue per firm by year and size (euros)

Year	Micro[a]	Small[b]	Medium[c]	Large[d]	Total
2005	224913	3786905	26556450	275903040	306471296
2006	225409	3929215	28261408	270760256	303176288
2007	223743	3957991	28520474	274239840	306942048
2008	221736	3760418	29400852	264480496	297863488
2009	200933	3389056	25549284	243715280	272854560
2010	202273	3701655	26872264	262652320	293428512
2011	203151	3807602	27532308	277520896	309063968
2012	184791	3562594	22995360	204020128	230762880
2013	180500	3583391	27238916	253172080	284174880
2014	179311	3709892	24173570	264069136	296530048

a; b; c; d: see notes on table 2

Table 7- Average Revenue per firm by year and sector (thousand euros)

Sector[a]	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
B	25388	22167	20721	18850	16438	20620	26050	3538	25909	29567
C	1888	2013	2129	2102	1838	1989	2082	1871	2006	2143
D	61775	61257	52509	52199	45573	37882	27100	11581	17264	16763
E	3496	3753	3782	3793	3363	3561	3566	3332	3126	3013
F	414	434	430	408	380	384	378	320	303	312
G	789	814	851	885	802	844	880	733	816	836
H	1013	1066	1121	1064	993	1088	1075	1206	1023	1138
I	213	221	229	224	220	223	224	221	212	221
J	1205	1202	1228	1234	1230	1228	1211	980	1125	1136
L	489	467	421	379	292	258	223	189	158	150
M	220	216	208	199	171	176	173	152	152	141
N	590	627	651	669	602	618	606	555	551	571
P	172	172	177	176	173	174	171	171	174	168
R	213	242	265	313	330	367	357	328	311	331
S	81	86	88	86	81	82	81	80	77	77

a) See note on table 3

4.4 Value Added

Table 8 shows the number of firms by source of value added. As described in the introduction, starting in 2012 we have a single source of data, namely the FRAME-SBS dataset. In the other years, the main source of the information for computing value added is the Sectoral Study F, that covers about 51% of firms in our sample. Balance sheets, instead, represent the main source of information only for 14% of firms.

Table 8 - Number of firms in each year by source of value added

Year	Balance Sheet	Sectoral F	Sectoral G	Tax Record	Frame	Sci	Missing	Total
2005	564296	2132905	620155			840	976018	4294214
2006	590544	2318661	712161			1112	707625	4330103
2007	613098	2413947	752111			1223	619181	4399560
2008	628953	2274227	666185			1277	857788	4428430
2009	648974	2228869	654313			1196	845440	4378792
2010	662255	2207932	650764	542765		1158	302106	4366980
2011	677820	2158440	611997	691702		1196	214261	4355416
2012					4347973			4347975
2013					4296467			4296467
2014					4263843			4263843

Table 9 shows the distribution of valued added by year and firm size. As expected, average value added is increasing in firm size. Table 10 shows the distribution of value added by year and sector. Not surprisingly, we find that in manufacturing sector value added is larger than in the construction and in the business services sector. The professional sector and the hotel and restaurants sectors show the lowest values.

Table 9 – Average Value added per firm by year and size (euros)

Year	Micro[a]	Small[b]	Medium[c]	Large[d]
2005	54797	776568	5324930	65903148
2006	56583	812523	5532020	65048416
2007	56395	822379	5593501	67176432
2008	54989	784977	5402467	63576880
2009	50509	710607	4857807	59786668
2010	51498	782292	5474149	65028724
2011	51782	793125	5471890	65724112
2012	49792	775706	5252062	62398340
2013	48766	787263	5294654	61353516
2014	49123	828034	5701721	61880592

a; b;c; d: see notes on table 2

Table 10 – Average Value added per firm by year and sector (thousand euro)

Sector[a]	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
B	2989	2767	2978	2295	2698	2639	2064	1853	1560	2019
C	434	466	487	475	405	465	484	480	485	507
D	9698	8436	7959	6020	5469	4929	3449	2841	2354	2045
E	1216	1154	1178	1222	1211	1273	1200	1128	1050	983
F	109	115	118	113	101	102	95	86	81	81
G	92	99	104	102	96	102	103	98	98	104
H	393	386	391	382	377	403	395	382	391	396
I	74	78	83	83	81	85	85	85	82	85
J	454	467	486	503	510	543	546	510	525	525
L	129	127	123	114	100	92	85	78	68	67
M	87	87	86	86	77	77	76	69	71	68
N	201	224	229	234	206	216	223	219	214	227
P	108	106	104	102	103	103	99	98	101	96
R	93	98	96	96	103	104	112	120	115	119
S	34	36	37	38	37	38	38	37	36	37

a) See note on table 3

5. Consistency checks

5.1 Comparison with National Accounts data

In this section we compare the growth rate of value added measured using our database and National Account data. Figure1 shows this comparison for the total economy; Figure 2 shows the growth rate for manufacturing and service sectors separately.

Aggregate value added dynamic computed using our dataset follows closely national accounts data only for 2010-2011 and from 2012 (see figure1). Looking at sectors separately, we observe that the dynamics of value added from our dataset replicates very well national accounts data in the manufacturing sector and services, while in the agriculture and mining sectors the two dynamics exhibit larger differences (see figure 2).

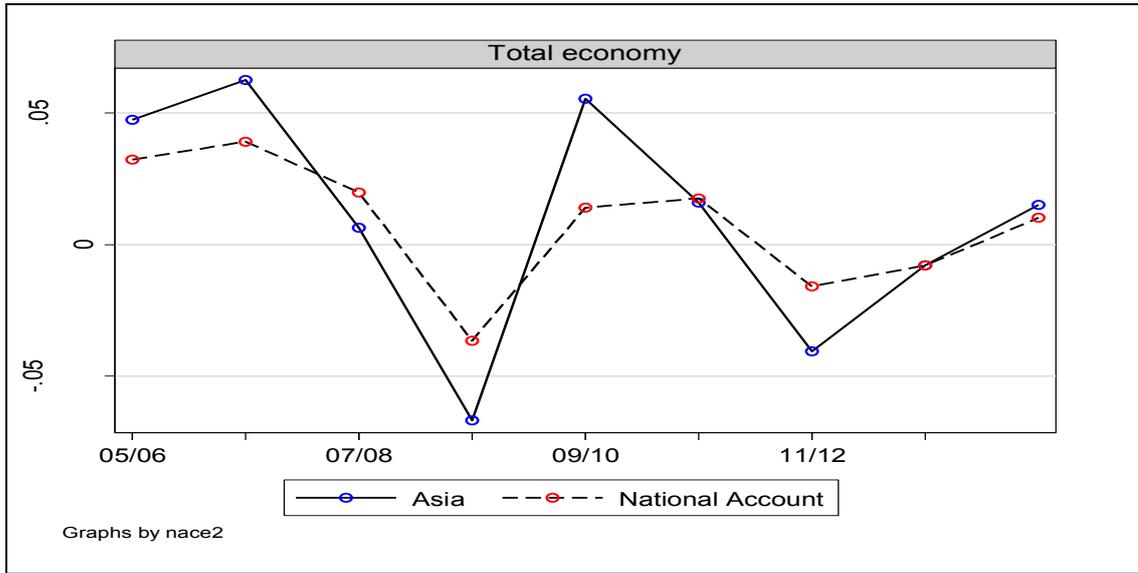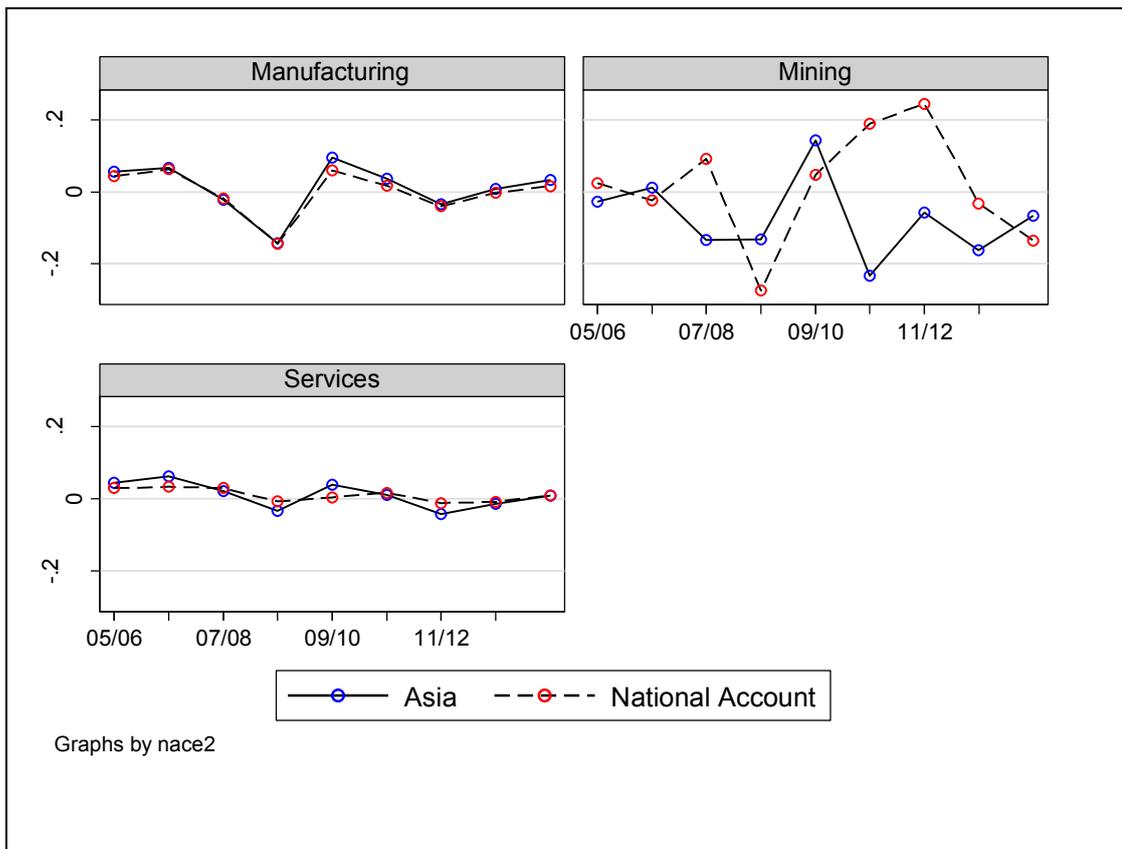**Figure 1- Value added dynamics (Total economy)**

Figure 2 - Value added dynamics (Manufacturing, Mining and Services)

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5.2 Dealing with missing values

As described in section 3, between 2005 and 2011 value added has been imputed for some firms. Tables C1 and C2 in the appendix show the share of firms with missing data on value added by year, firm size and sectors. Table 11 shows the share of imputed value added for total economy, manufacturing, service, and mining sectors.

Table 11 - Share of imputed value added (%)

Year	Manufacturing	Services	Mining	Total
2005	1.2	6.5	0.1	7.8
2006	1.0	4.7	2.2	7.9
2007	0.9	4.2	0.8	5.9
2008	1.0	5.1	0.0	6.2
2009	0.9	6.7	3.6	11.2
2010	0.4	1.9	0.3	2.6
2011	0.5	1.7		2.3
2012		0.4		0.4
2013				
2014				

In 2005 the share of imputed value added is 1.2 percent for manufacturing and 6.5 percent for service sectors. The percentage of imputed values reaches the maximum value in 2009, 11.2 percent for the whole economy, and it decreases in the subsequent years. In all years the share of imputed value added is higher in the service sectors than in manufacturing.

Figure 3 - Value added imputed and not imputed (Total economy)
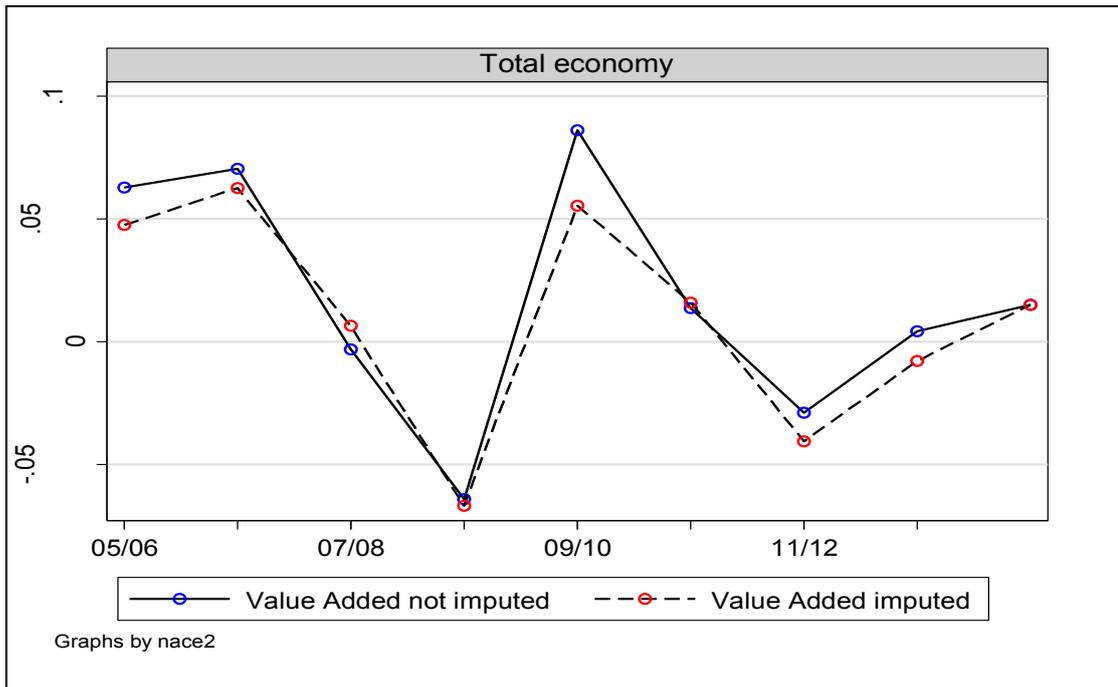
Figure 4 - Value added imputed and not imputed (Manufacturing, Services , Agriculture and Mining)
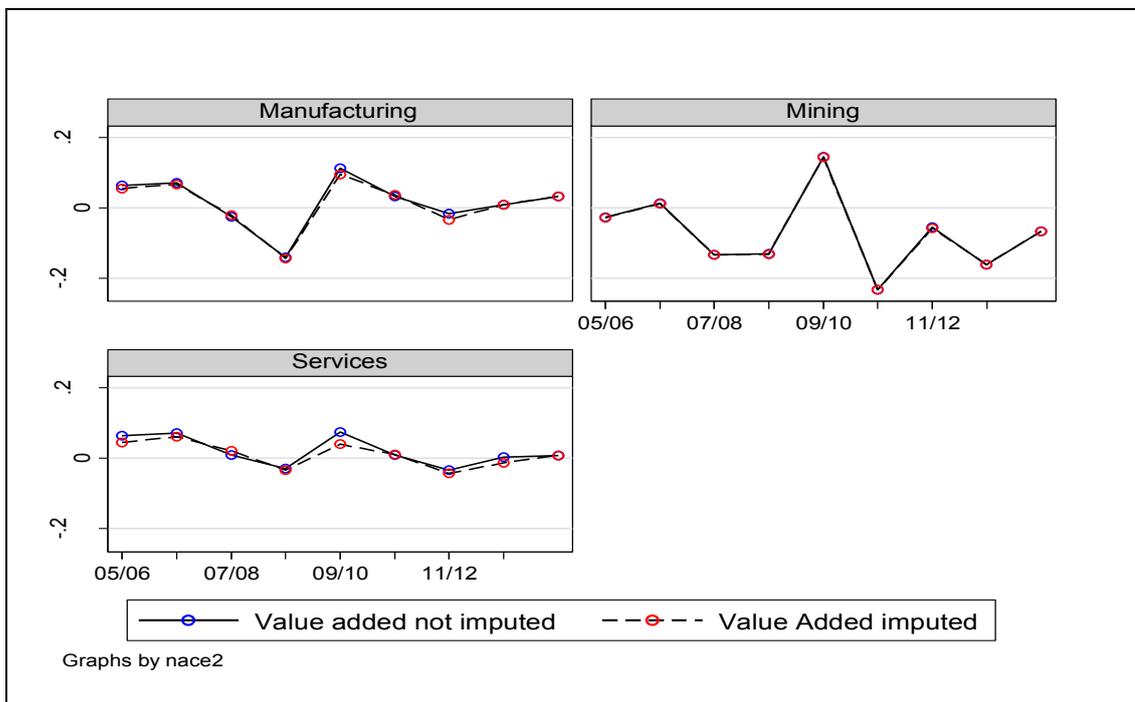
Figure 3 shows the comparison between the growth rate of value added with and without imputation for total economy. Figure 4 shows the dynamics for manufacturing, services, agriculture and mining sectors separately. In the appendix we report the growth rate of value added with and without imputation for each 2-digit sectors (see figures B3 and B4 in Appendix B).

5.3 Dealing with negative value added

While at the aggregate level value added is always positive, at firm level this is not always the case. In this section we compare the dynamic of value added between our dataset and National Account, excluding from our dataset firms with negative value added. While there is no a priori reason to exclude firms with negative value added, in many studies these firms are indeed excluded from the analysis. This data cleaning procedure can be particular problematic during crisis period, because the share of firms with negative value added increases substantially.

Table 12 shows the share of firms with negative value added by year. This share increases during the period under consideration, and in particular from 2012. The share of firms with negative value added is bigger in the service sectors than in manufacturing. Table 13 shows the share of firms with negative value added by firm size.

Table 12 - Share of firms with negative Value Added

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
B	0.99	8.18	1.82	0.96	2.82	1.73	1.83	3.56	4.27	3.71
C	0.95	0.99	1.12	1.46	1.99	1.50	1.57	2.57	2.16	0.84
D	0.58	0.87	0.30	2.52	0.74	1.24	1.15	1.53	1.70	2.16
E	6.81	5.85	11.06	15.00	95.92	13.77	10.29	11.53	7.20	35.03
F	1.88	1.48	1.29	1.62	2.91	3.04	4.93	11.44	12.57	12.85
G	8.43	2.35	2.42	2.92	2.98	3.15	3.40	4.49	4.32	3.81
H	3.30	0.71	0.45	1.16	0.95	0.55	0.70	1.40	1.51	4.71
I	1.11	1.34	1.29	1.24	1.22	1.61	1.45	1.57	1.79	1.57
J	1.08	0.85	0.97	1.14	1.33	1.25	0.91	1.41	1.37	1.26
L	4.20	3.35	4.08	5.73	6.44	6.44	6.99	10.65	11.58	13.46
M	1.79	5.60	1.42	1.98	1.80	1.73	2.04	3.28	3.72	3.17
N	2.22	2.60	1.58	2.08	2.52	1.81	2.14	2.19	2.97	2.38
P	0.37	0.32	0.58	0.41	0.71	0.61	0.71	0.91	0.82	1.12
R	2.48	2.10	2.50	3.31	2.52	2.82	2.91	3.89	3.75	3.08
S	1.17	1.65	1.35	1.34	1.29	1.58	1.42	1.95	1.65	1.86

Table 13 - Share of firms with negative Value Added by year and size (Total Economy)

Year	Micro[a]	Small[b]	Medium[c]	Large[d]
2005	4.71	2.46	2.57	8.50
2006	2.20	1.37	1.79	5.32
2007	2.04	1.44	1.50	7.58
2008	2.55	1.83	2.10	11.04
2009	2.93	3.35	8.29	38.05
2010	2.76	2.34	3.05	9.90
2011	3.10	2.61	2.64	11.93
2012	4.89	4.57	4.63	8.79
2013	5.10	4.53	5.70	8.81
2014	5.13	4.88	9.77	11.39

a; b; c; d: see notes on table 2

Figures 5 and 6 show the growth rate of value added in our dataset when we exclude firms with negative value added compared to the aggregate dynamic reported in National Accounts.

Figure 5 - Value added dynamics (Total economy) - *only firms with positive value added
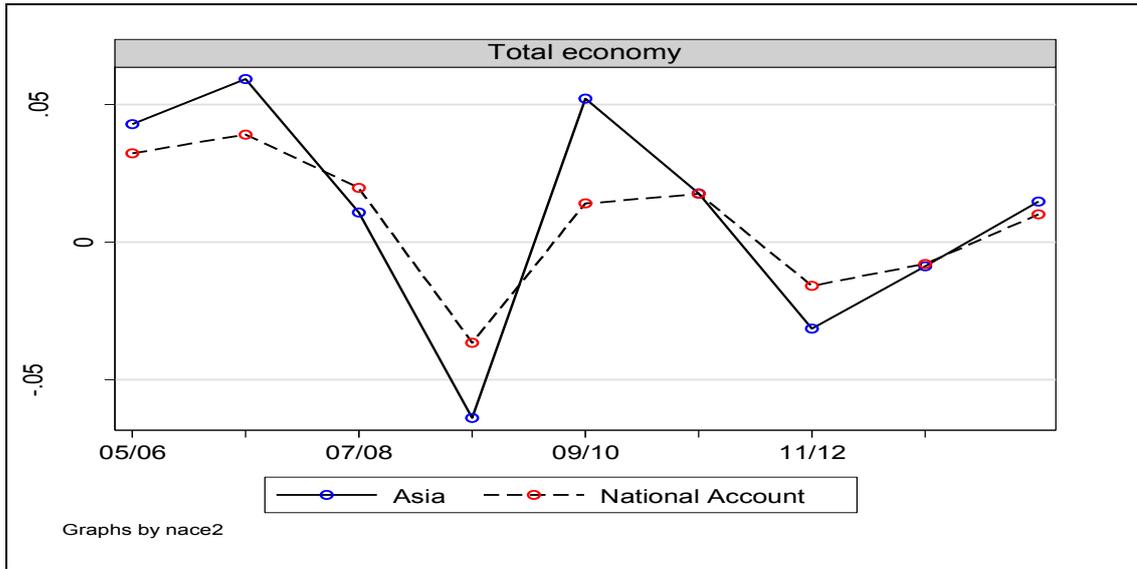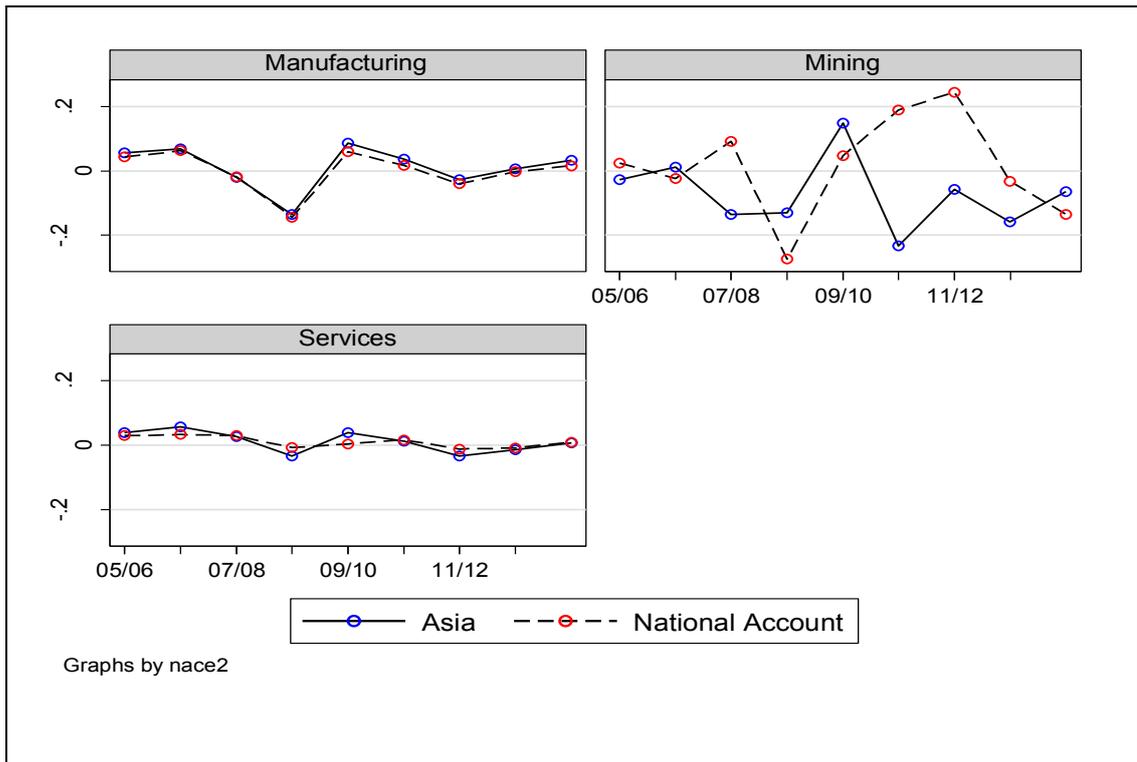

Figure 6 - Value added dynamics (Manufacturing, Mining and Services) *only firms with positive value added

Key Nace 2-digit sectors

B: Mining industry

C: manufacturing

- C10-12: Food products, beverages and tobacco
- C13-15: textile industries , manufacture of wearing apparel , manufacture of leather and related products
- C16: Manufacture of wood and products of wood and cork (except furniture), manufacture of articles of straw and plaiting materials
- C17: Manufacture of paper and paper products
- C18: Printing and reproduction of recorded media
- C20: Manufacture of chemical products
- C21: Manufacture of basic pharmaceutical products and pharmaceutical preparations
- C22: Manufacture of rubber and plastic products
- C23: Manufacture of other products of other non-metallic minerals
- C24: Metallurgy
- C25: Manufacture of metal products (except machinery and equipment)
- C26: Manufacture of computer, electronic and optical products, medical equipment, measuring equipment of watches
- C27: Manufacture of electrical equipment and non-electrical equipment for domestic use
- C28: Manufacturing of machinery and equipment N.C.A.
- C29: Manufacture of motor vehicles, trailers and semi-trailers
- C30: Manufacture of other transport equipment
- C31-32: Fabbricazione di mobili e altre industrie manifatturiere
- C33: Repair, maintenance and installation of machinery and equipment

D: Supply of electricity, gas, steam and air conditioning

E: Supply of water

- E36: Collection, treatment and supply of water
- E37-39: Management of sewerage, collection, treatment and disposal of waste, materials recovery, remediation activities and other waste management services

F: Construction

G: Trade

- G45:Wholesale and retail trade and repair of motor vehicles and motorcycles
- G46: Wholesale trade (excluding motor vehicles and motorcycles)
- G47: Retail trade(excluding motor vehicles and motorcycles)

H: Transport and storage

- H49: Land transport and transport via pipelines
- H50: Maritime and waterway transport
- H51: Airplane transport
- H52: Ware hotel and restaurants and support activities for transportation

I: hotel and restaurants and catering

J: Information and communication services

- J58: Publishing activities
- J59-60: Film production, video and television program production, sound and music recording, programming and broadcasting activities
- J62-63: Production of software, consultancy and related activities , activities of the intelligence services and other computer services

L: Real estate activities

M: Professional, scientific and technical activities

- M69-70: Legal and accounting activities; corporate management and management consulting

- M71: Activities of architecture and engineering studies; technical testing and analysis
- M72: Scientific research and development
- M73:Advertising and market research
- M74-75: Other professional, scientific and technical activities; veterinary services

N: Rent, travel agencies, support activities to firms
- N77: Rental business and operational leasing
- N78: Research, selection, staffing activities
- N79: Activities of travel agencies , tour operator reservation service and related activities
- N80-82: Security services and investigation; services to buildings and landscape activities, support activities for the functions of office and other support services for businesses

P: Education

Q: Human health and social activities
- Q86: Activities of health services
- Q87-88: Social assistance

R: Creative activities, arts and entertainment activities
- R90-92: Creative activities, arts and entertainment activities, activities of libraries, archives, museums and other cultural activities, activities related to gambling and casinos
- R93: Sports activities, entertainment and fun

S: Other activities
- S94: Interest groups
- S95: Repair of computers and personal and household goods
- S96: Other personal service activities

Appendix B

Figure B1- The dynamics of value added–Comparison between Asia and National Account (Manufacturing)
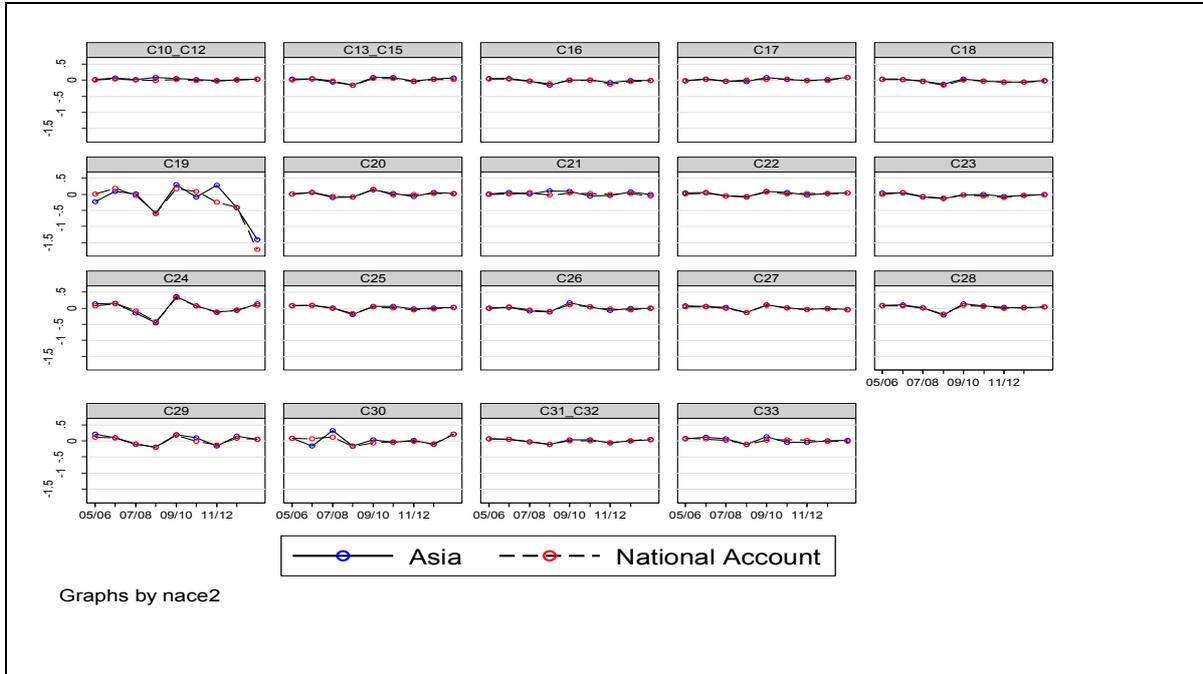

Graphs by nace2

Figure B2 - The dynamics of value added–Comparison between Asia and National Account (Mining and Services)
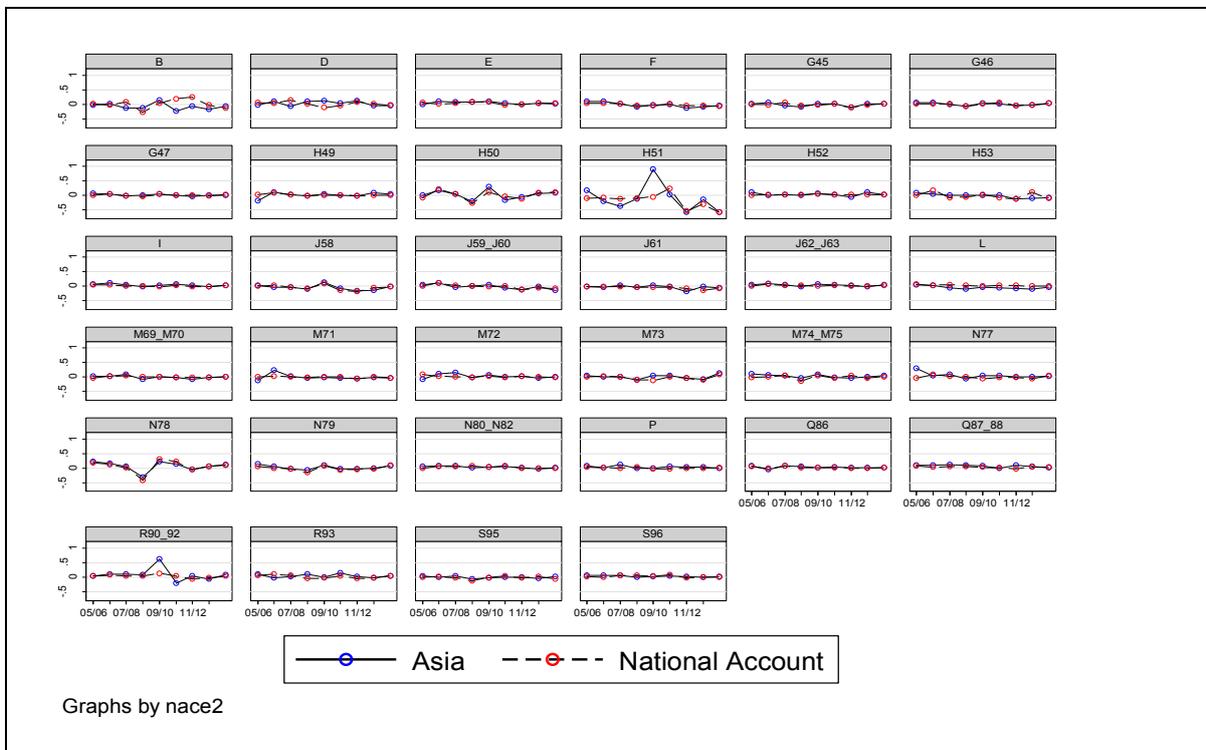

Graphs by nace2

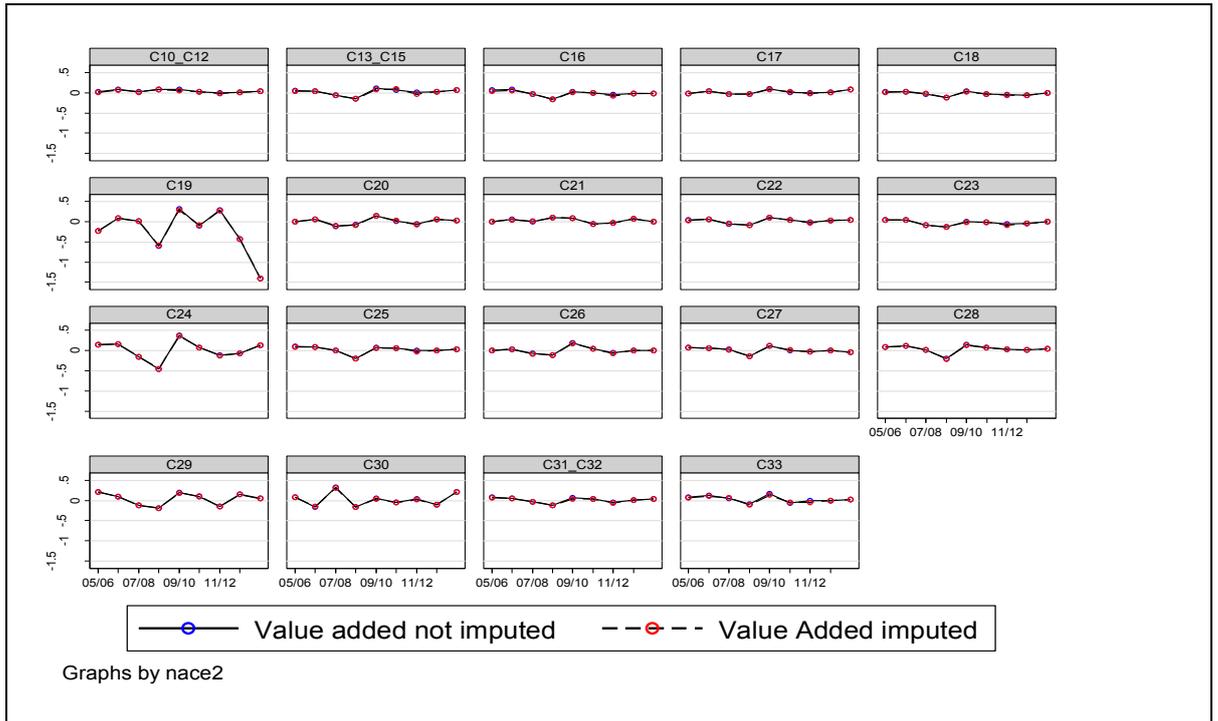**Figure B3 -The dynamics of value added imputed and not imputed – Manufacturing**

Graphs by nace2

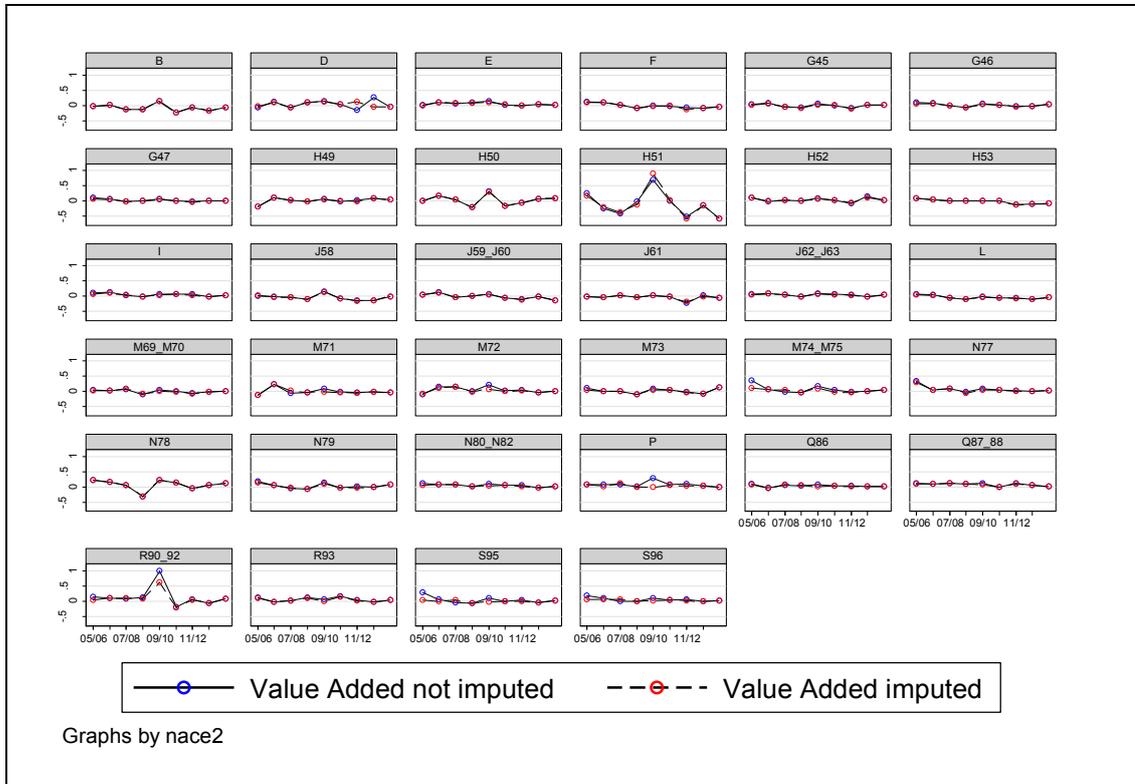**Figure B4 -The dynamics of value added imputed and not imputed – Agriculture, Mining and Services**

Graphs by nace2

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Table B1 - Number of firms by year and by Nace2-digit

ateco2d	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
5	1	1	1	1	1	1	1	1	1	1
6	5	5	5	7	8	12	12	12	11	12
7	4	5	5	3	3	5	5	4	3	1
8	2818	2733	2702	2653	2516	2459	2444	2351	2298	2198
9	25	26	26	28	27	30	33	39	36	38
10	55926	55525	54450	54404	53270	52740	53605	53585	53877	53218
11	2764	2759	2784	2814	2736	2800	2860	2883	2946	3191
12		1	1	3	3	3	4	4	6	6
13	19790	19073	18532	17871	16811	16194	15624	15292	14775	14359
14	37757	36732	35736	35454	33076	30955	31693	31193	30349	29442
15	17442	17064	16735	16551	15740	15059	15507	15567	15598	15436
16	40483	39415	38522	37458	35681	34590	33710	32711	31487	30001
17	4398	4352	4299	4273	4162	4081	4064	3996	3890	3800
18	18621	18388	18137	17848	17268	17034	16809	16402	16104	15469
19	335	316	321	323	310	308	315	307	300	294
20	4574	4501	4453	4482	4412	4368	4409	4330	4358	4320
21	466	469	455	480	477	463	480	439	445	446
22	11666	11573	11327	11223	10783	10590	10594	10389	10215	10093
23	24541	24232	23855	23513	22461	21945	21689	21106	20605	19829
24	3998	3902	3891	3883	3774	3735	3727	3626	3581	3470
25	77140	75855	74885	74280	70920	68887	68838	67307	65736	64366
26	6194	6107	5941	5820	5519	5412	5362	5228	5070	5006
27	9806	9618	9530	9474	9140	8977	9047	8809	8624	8505
28	25127	24892	24725	24751	24338	24056	24136	23771	23532	23181
29	2454	2412	2404	2401	2346	2352	2369	2327	2308	2253
30	2854	2943	2994	3065	2786	2642	2680	2521	2456	2386
31	24182	23315	22627	21835	20813	20129	19819	19202	18590	18130
32	30786	30333	30101	30761	31117	31113	31081	30723	30518	29921
33	38456	39670	41504	41845	41247	41088	41297	41013	39933	39279
35	2445	2617	2912	3300	3679	4742	7102	9363	10315	10459
36	914	903	883	897	884	863	846	857	874	844
37	1423	1404	1409	1424	1405	1425	1433	1422	1428	1409
38	5857	5881	5942	6065	5958	6063	6147	6173	6244	6192
39	469	477	478	509	536	574	631	637	662	701
41	155604	157590	158064	158752	150992	144967	139430	132057	130824	124291
42	6790	6838	6804	7125	7066	7045	7125	6854	6913	6672
43	426346	435453	457450	465963	461875	452244	441568	431835	411707	398140
45	124481	123736	123032	121989	119888	119075	118787	118053	117223	115256

Table B1 - Number of firms by year and by Nace2-digit (continues)

ateco2d	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
46	419515	418647	423078	420303	410480	408248	405086	401339	397450	390962
47	689389	683346	677182	666496	649479	642794	644411	640483	637148	616915
49	122942	119726	115988	116369	111189	108147	106079	104387	102571	98793
50	1395	1422	1439	1582	1632	1697	1743	1737	1703	1702
51	249	250	252	255	235	237	249	234	230	228
52	21609	22131	22746	22760	22488	22682	23338	22989	22897	22558
53	1889	1904	1923	1962	1877	2011	2161	2321	2340	2405
55	40155	40608	41217	42186	42992	43750	45097	45735	46473	46315
56	234368	237548	242277	249522	246663	250853	259893	263600	267798	265698
58	6041	6095	6073	6095	5809	5764	5620	5394	5307	5139
59	6518	6762	6820	6949	6870	6928	6937	6911	6778	6842
60	1830	1779	1659	1646	1604	1602	1620	1617	1609	1580
61	3465	3919	3945	4029	3968	4002	4104	4157	4331	4321
62	46425	46149	45636	45494	44973	45281	44912	45095	44364	45429
63	29796	30822	32191	32272	31661	31921	32437	32715	32959	33686
68	226447	232776	238482	236890	238874	241336	243983	244277	245870	239134
69	236112	243504	259198	267751	271691	274491	270946	276611	273597	280097
70	38938	40782	42097	43719	45235	47329	49152	50843	51044	53939
71	207046	213887	226729	231171	231372	231521	214096	214289	203303	203139
72	8400	8527	8590	8591	8506	8571	7978	7859	7987	8526
73	20335	20276	20038	20121	19558	19613	19762	19859	19322	19467
74	104490	106914	114233	117599	120277	122362	122919	126687	122543	128473
75	10299	10733	11632	11445	11227	11198	10742	11393	11389	12254
77	16238	16935	17205	16553	16217	16022	15214	14520	14385	13726
78	1276	1268	1252	1245	1209	1199	1161	1141	1085	1080
79	12052	12513	13058	13753	14180	14686	15384	15480	15654	15802
80	2596	2613	2633	2679	2654	2741	2923	2827	2742	2600
81	29754	29858	36643	38436	40966	42059	45351	46595	46193	48170
82	71958	70981	67199	65734	65945	65462	61593	60288	58646	58517
85	22447	23298	23855	24361	24280	24916	26448	27282	27705	29087
86	207572	214613	214178	222607	229197	235694	242344	247313	248039	262923
87	3547	3676	3759	3798	3766	3999	4320	4570	4877	5024
88	5202	5715	6232	6391	6480	6939	7831	8402	8701	9348
90	27800	28738	29802	29969	29120	28579	26907	27028	25777	26612
91	993	1059	1097	1102	1087	1104	1063	1033	981	997
92	3564	3843	4328	5157	5574	6030	6708	7195	7922	7967
93	24776	25103	25736	26124	25883	26378	26945	27655	28363	28593
95	30253	29806	29220	28045	27083	26578	26327	26012	25097	25018
96	169591	170461	172016	173741	172463	173230	176349	177713	177445	178162

Appendix C

Statistics on missing data for value added

Table C1 - Value added missing by Nace2-digit (percent)

ateco2d	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-
6	20.00	20.00	20.00	28.57	12.50	0.00	0.00	-	-	-
7	0.00	20.00	20.00	0.00	33.33	40.00	40.00	-	-	-
8	21.36	16.90	14.54	14.66	12.16	8.95	9.78	-	-	-
9	8.00	7.69	11.54	10.71	11.11	10.00	18.18	-	-	-
10	24.23	20.88	17.20	18.37	16.34	6.41	6.90	-	-	-
11	52.64	51.61	49.28	49.82	47.30	11.71	11.22	-	-	-
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-
13	27.97	23.77	22.39	25.48	24.86	7.14	7.54	-	-	-
14	22.70	18.58	15.37	20.81	19.88	7.33	12.59	-	-	-
15	19.20	14.33	12.63	14.80	14.46	6.29	7.55	-	-	-
16	17.01	12.70	9.14	16.09	15.21	4.35	3.78	-	-	-
17	17.46	14.45	12.58	13.41	12.11	5.68	6.64	-	-	-
18	16.66	12.51	11.06	13.12	11.80	5.09	5.04	-	-	-
19	25.07	21.20	21.18	21.67	17.10	7.79	7.94	-	-	-
20	13.99	11.42	10.15	11.16	10.47	6.87	8.10	-	-	-
21	13.30	10.66	9.67	15.42	16.35	14.04	16.46	-	-	-
22	15.64	12.67	10.21	11.43	9.88	5.92	7.22	-	-	-
23	19.80	16.91	14.23	17.73	16.27	5.93	6.50	-	-	-
24	17.36	14.61	14.50	16.12	14.81	7.26	7.08	-	-	-
25	15.60	12.30	10.51	12.96	10.87	5.00	6.24	-	-	-
26	16.92	13.31	11.63	13.13	12.36	7.11	8.09	-	-	-
27	15.13	11.83	9.35	10.58	10.05	5.38	6.72	-	-	-
28	13.08	9.94	8.38	9.16	8.90	5.48	6.51	-	-	-
29	23.76	20.52	19.38	21.07	19.57	8.33	10.76	-	-	-
30	31.22	29.05	26.99	28.61	26.17	12.64	14.55	-	-	-
31	17.53	12.14	9.13	12.03	11.32	4.94	5.37	-	-	-
32	25.38	22.59	21.44	26.00	25.82	4.71	2.60	-	-	-
33	19.01	13.41	11.52	15.45	14.56	4.94	4.52	-	-	-
35	27.89	28.51	29.02	31.00	31.37	23.85	18.60	-	-	-
36	52.30	52.05	49.83	50.50	50.00	27.93	24.94	-	-	-
37	67.81	65.17	65.65	64.82	63.99	11.02	9.49	-	-	-
38	28.33	24.84	22.79	23.63	20.73	9.15	9.63	-	-	-
39	39.23	32.91	28.66	31.04	27.99	11.32	11.41	-	-	-
41	25.08	22.85	21.83	24.45	23.09	16.13	14.97	-	-	-
42	22.37	20.68	19.84	21.68	21.10	16.30	16.83	-	-	-
43	17.20	13.20	12.51	19.41	20.59	6.64	4.80	-	-	-
45	17.66	14.43	9.85	14.58	13.73	4.43	4.21	-	-	-
46	21.62	15.30	13.13	14.74	13.54	6.72	5.58	-	-	-

Table C1- Value added missing by Nace2-digit (percent) (continues)

ateco2d	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
47	21.39	15.81	11.95	14.36	13.35	4.25	3.39	-	-	-
49	16.15	11.49	9.81	12.04	10.44	5.04	5.87	-	-	-
50	19.57	14.35	12.93	14.10	12.50	6.31	7.23	-	-	-
51	49.00	50.40	52.78	52.55	50.21	27.43	26.51	-	-	-
52	37.43	32.34	32.21	32.74	32.03	11.86	12.86	-	-	-
53	32.82	25.79	22.98	27.68	26.11	9.35	8.24	-	-	-
55	22.62	18.51	15.70	19.10	19.54	9.68	9.30	-	-	-
56	24.99	18.20	14.65	16.98	14.60	6.56	7.38	-	-	-
58	24.30	19.26	16.99	17.69	15.29	8.22	7.74	-	-	-
59	41.07	31.66	30.34	33.66	32.68	10.75	6.96	-	-	-
60	18.42	16.86	13.08	13.85	11.91	6.93	6.54	-	-	-
61	66.20	62.69	63.42	65.33	65.45	20.74	13.26	-	-	-
62	24.26	16.94	15.37	19.36	20.57	7.52	3.89	-	-	-
63	20.40	16.90	16.52	19.51	18.47	7.61	5.87	-	-	-
68	20.21	14.17	12.00	12.53	11.33	6.39	6.06	-	-	-
69	11.63	7.87	7.00	20.62	21.59	6.26	1.05	-	-	-
70	44.27	20.39	17.69	23.93	26.13	9.37	4.98	-	-	-
71	14.52	9.96	9.25	24.05	26.07	8.32	0.90	-	-	-
72	71.67	68.98	68.89	71.12	71.07	20.87	6.07	-	-	-
73	35.95	19.68	15.85	21.20	21.35	8.56	5.31	-	-	-
74	40.06	14.63	13.68	24.21	27.90	8.64	2.25	-	-	-
75	15.23	10.94	9.41	28.90	29.72	8.49	0.50	-	-	-
77	54.94	52.54	50.54	48.55	47.20	11.93	8.23	-	-	-
78	60.19	58.36	58.79	58.88	58.48	14.01	8.10	-	-	-
79	23.35	15.07	14.01	18.13	18.12	7.91	6.49	-	-	-
80	58.67	56.33	56.89	57.15	56.29	16.96	13.31	-	-	-
81	28.78	21.67	32.77	37.58	41.12	9.89	8.60	-	-	-
82	67.55	30.09	24.25	29.91	32.12	14.27	8.13	-	-	-
85	56.99	54.18	53.76	54.16	52.36	13.65	5.15	-	-	-
86	14.61	10.66	9.38	14.19	16.90	4.54	1.72	-	-	-
87	38.12	36.07	34.80	33.31	31.01	11.60	11.13	-	-	-
88	47.75	42.26	43.89	42.09	41.94	12.05	7.71	-	-	-
90	70.40	65.87	65.82	70.49	71.02	20.05	2.41	-	-	-
91	58.61	43.44	43.30	48.00	46.73	15.49	6.87	-	-	-
92	46.21	41.50	39.16	37.81	33.48	8.21	7.59	-	-	-
93	47.35	44.60	44.06	45.42	44.50	13.89	8.50	-	-	-
95	43.33	20.96	12.39	31.05	32.39	5.02	1.91	-	-	-
96	26.26	16.69	10.32	26.79	26.63	5.03	2.94	-	-	-