The impact of new industrial classification on survey results: first evidence from a back casting exercise based on the ISAE construction survey

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CONSTRUCTION SECTOR: MAIN CHANGES FROM NACE REV. 1.1 TO NACE REV. 2

The main changes related to construction activities concern the expansion of detail for NACE Rev.2: the number of divisions (2 digit level) has increased from 1 to 3.

More specifically, the division 45 in the old classification splits in the following divisions according to NACE Rev.2:

- 41 – construction of buildings;
- 42 – civil engineering;
- 43 – specialized construction activities.

Moreover, an activity previously included in the construction sector moves to other sectors and vice versa some activity in the manufacturing and service sector moves to the construction.

The statistical Units previously surveyed under this classifications have not been included in the calculation of the new series.
CONSTRUCTION SECTOR: MAIN CHANGES FROM NACE REV. 1.1 TO NACE REV. 2

In NACE Rev.2, parts of the following activities move to Construction sector:

- Manufacture of builders’ carpentry and joinery (2030);
- Development and selling of real estate (7011);
- Manufacture of builders’ ware of plastic (2523);
- Manufacture of metal structures and parts of structures (2811);
- Manufacture of lifting and handling equipment (2922);
- Manufacture of builders’ carpentry and joinery of metal (2812).

Until now, these sectors are surveyed in the Service and Manufacturing surveys; they will be included in the new sample for the construction survey starting from next May, 2010.
These sectors are not considered in the backcasting exercise for the following reasons:

- questionnaires for the construction, service and manufacturing surveys present significant differences;

- the correct identification of firms migrating from the manufacturing and service to the construction sector is possible only at the 5-digit NACE level, an information that is not immediately available from our databases.

Once all the units will be re-coded at 5-digit, we will proceed the evaluate the statistical relevance of firms migrating to the construction sector, in order to make a final decision whether to include them or not in the backcasting.
THE MICRO APPROACH: RECODING INDIVIDUAL DATA

We use the double coded (at 5-digit level) ASIA 2006 Business Register released by the Italian national statistical institute (ISTAT). In ASIA, a NACE code is assigned to each unit, and this code is the code we use in the backcasting.

It isn’t always possible to find a specific statistical unit in the ASIA register so the statistical unit is re-coded using:

- the official correspondence table released by EUROSTAT when the correspondence between the old and new classification is univocal;

- the conversion table simply calculated on the basis of the frequency distribution in the new ASIA 2006 register when the old classification splits in different categories of the new classification.
THE MICRO APPROACH: TIME SERIES RECONSTRUCTION

Once the Units have been re-coded according to the new NACE, we proceeded as follow:

- frequencies of response for each qualitative question has been recalculated using the same routine as for the old data, also introducing new weights at the sector level;

- in the old routine the weights were the number of employees in the Universe with reference to housing, other buildings and public works sector; now, we use value added data for 2005 concerning the three new divisions 41, 42 e 43;

- We calculated the balances for every question, as difference between the positive and negative answers.
THE MICRO APPROACH: REMARKS

From our experience, we highlight the following remarks for the micro approach:

• As far as we go back in time, the micro approach increases costs and reduces the effectiveness because:

  ◆ it works well for the last part of the sample, when the units that are surveyed are generally comprised in the 2006 Business Register: we re-coded the respondents unit for the years 2000-2008;

  ◆ the task of finding individual NACE codes from the register becomes more difficult going back in time, when the probability that the unit is not active anymore is higher: we applied a macro approach for the period 1995-1999;

• the variance of the final estimates may increase, because for some of the sectors the sample coverage may be low. In our case, in fact, we are able to assign a relatively low number of firms the new sector 42, possibly resulting in an high variance of results for this sector.
THE MACRO APPROACH: THE METHOD USED

The method used for the macro reconstruction goes as follow:

1) we have calculated a “conversion matrix” based on the reconstructed data for the period 2000-2008, where the coefficients

\[ t_{ai, p(m), l} \]

have been calculated as the ratio between the percentage (p) of positive/neutral/negative answers for each variable m and each division “i” classified according to the new NACE, and the corresponding old NACE aggregate for the construction sector in a whole for the year t (for t=200001 to 200812) and month l;

2) in order to take into account possible seasonal effects, the average conversion coefficients have been calculated over the period considered for each month l:

\[ a_{i, p(m), l} \]

where i, p (m) and l are, respectively, the new division, the percentage for variable m and the month
THE MACRO APPROACH: THE METHOD USED

3) In a second step, construction estimates according to the new classification are obtained as the product between the old aggregate for the total sector and the average conversion coefficient for the month \(l\) and year \(t\):

\[
t K_{i,p(m),l} = a_{i,p(m),l} \times t T_{45,p(m),l}
\]

where \(t K_{i,p(m),l}\) is the aggregate for the division \(i\) according to the new classification, \(t\) is the year (in this case for \(t=1995\) to \(1999\)), \(p\) is the percentage of variable \(m\) and \(l\) is the month; \(a_{i,p(m),l}\) is the average conversion coefficient as described above and \(t T_{45,p(m),l}\) is the old aggregate (according to NACE Rev.1.1 the code is 45) for the year \(t\), \(p\) (\(m\)) is the usual percentage of variable \(m\) and \(l\) is the month;

4) Then, we calculated the series for the new total sector as aggregation of the series of the divisions 41, 42 and 43 by the same routine used for the micro data.
We underline that there are some disadvantages and source of potential errors in the macro method applied:

- we accept the strong assumption of stability of the calculated ratios over time;
- finally, the macro approach used is an approximate solution that does not analyze in deepness the revision effects on time series.
Tables and figures in the following slides highlight the impact of the reconstruction of the series according to the NACE Rev.2 for the construction sector in a whole:

- the impact seem to be significant on the mean and the variability for assessments on construction activity and expectations on sale prices only;

- generally, impact is more evident in the years 2000-2008 rather than in 1995-1999; this is due to the different approaches used for backcasting;

- the new series show some “outliers” not evident in the old data: in fact, in the micro data reconstruction, the recoding process of the unit caused a redistribution of the respondents according to the new sectors that have different weights respect with the old ones;

- The confidence climate, calculated as the simple arithmetic average of the balances of the assessments on order-books (or construction plans) and employment expectations and indexed to the year 2000, show very similar features to the old climate.
THE NEW TIME SERIES

Fig. 1 - Confidence Climate
(Based index 2000=100)
THE NEW TIME SERIES

Fig. 2 - Assessments on order-books

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Fig. 3 - Expectations on employment

-50 -30 -10 10 30 50 70

New Old
Table 1  Descriptive statistics of the main balances of the ISAE construction survey

<table>
<thead>
<tr>
<th></th>
<th>Assessments on order-books</th>
<th>Assessments on construction activity</th>
<th>Expectations on order-books</th>
<th>Expectations on sales price</th>
<th>Expectations on employment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Old series</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-22.74</td>
<td>-0.32</td>
<td>8.05</td>
<td>13.93</td>
<td>3.05</td>
</tr>
<tr>
<td>Median</td>
<td>-20.00</td>
<td>-1.00</td>
<td>6.00</td>
<td>12.00</td>
<td>2.50</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>13.40</td>
<td>13.75</td>
<td>13.58</td>
<td>9.54</td>
<td>14.59</td>
</tr>
<tr>
<td>Min.</td>
<td>-64.00</td>
<td>-36.00</td>
<td>-30.00</td>
<td>-13.00</td>
<td>-35.00</td>
</tr>
<tr>
<td>Max</td>
<td>20.00</td>
<td>36.00</td>
<td>46.00</td>
<td>52.00</td>
<td>35.00</td>
</tr>
<tr>
<td>Range</td>
<td>84.00</td>
<td>72.00</td>
<td>76.00</td>
<td>65.00</td>
<td>70.00</td>
</tr>
<tr>
<td><strong>New series</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-18.16</td>
<td>-4.87</td>
<td>8.76</td>
<td>7.92</td>
<td>3.52</td>
</tr>
<tr>
<td>Median</td>
<td>-16.82</td>
<td>-5.62</td>
<td>5.54</td>
<td>7.03</td>
<td>2.04</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>13.78</td>
<td>12.77</td>
<td>16.79</td>
<td>8.31</td>
<td>17.90</td>
</tr>
<tr>
<td>Min.</td>
<td>-60.76</td>
<td>-35.34</td>
<td>-22.33</td>
<td>-13.59</td>
<td>-31.34</td>
</tr>
<tr>
<td>Max</td>
<td>12.38</td>
<td>39.51</td>
<td>69.14</td>
<td>30.35</td>
<td>61.24</td>
</tr>
<tr>
<td>Range</td>
<td>73.15</td>
<td>74.85</td>
<td>91.47</td>
<td>43.94</td>
<td>92.59</td>
</tr>
</tbody>
</table>

Source: own calculations on ISAE data
Table 2 Cross-correlation function between Confidence Climates and Construction production index

<table>
<thead>
<tr>
<th></th>
<th>Cross-correlation function</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>$\rho (0)$</td>
<td>$\rho_{\text{max}}(\text{lead/-lag/+})$</td>
<td></td>
</tr>
<tr>
<td>Confidence Climate (NACE Rev.1)</td>
<td>0.47</td>
<td>0.37 (-3)</td>
<td></td>
</tr>
<tr>
<td>Confidence Climate (NACE Rev.2)</td>
<td>0.42</td>
<td>0.36(-3)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own calculations on ISAE and ISTAT quarterly data
Period: 1995-1,2008-4

Table 2 provides a first evidence of the cross-correlation function between the Italian construction production index and both the new Confidence Climate and the “old” one. As we see, the performance of the two indexes is quite similar, both the indexes being coincident indicators with respect to production, with an average correlation being around 0.4-0.5.