Effects of inter-country heterogeneity on euro area business cycle dating

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1   Introduction

To see whether heterogeneity is the driving force behind the dating of previous recessions, I redraw the charts for GDP, investment and employment for post-98 and GDP and investment for pre-98 periods using GDP weighted, simple sum and finally population weighted series together with GDPs of the major Euro area economies. Since each of these exercises put different weights on different countries, they also treat heterogeneity among countries differently. Moreover, we can observe whether committee announced dates match to a specific country's business cycles. Therefore the exercise might help us understand whether there exists any role of heterogeneity in the previous datings.

2   Data

Before any further comment, it is important to note that all exercises are done using the current vintage data available on IMF and EuroStat databases and aggregate data for EA-17 is used when available. Noting that, I used IMF data of Quarterly National Accounts for EA-11 countries plus Greece for pre-98 period, in particular

- Quarterly Gross Domestic Product (SA, Expenditure Approach, Millions of US dollars, volume estimates, fixed PPPs, OECD reference year, annual levels, seasonally adjusted)

- Quarterly Gross Fixed Capital Formation (SA, Millions of US dollars, volume estimates, fixed PPPs, OECD reference year, annual levels, seasonally adjusted)

For post-98 period, I used EuroStat data for EA-17

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- Quarterly Gross Domestic Product Volumes (SA and adjusted by working days, Millions of euro, chain-linked volumes, reference year 2005 (at 2005 exchange rates))

- Quarterly Gross Fixed Capital Formation (SA and adjusted by working days, Millions of euro, chain-linked volumes, reference year 2005 (at 2005 exchange rates))

- Quarterly Employment (NSA, Resident Population Concept - LFS)

Both population weighted and GDP weighted data are constructed using latest available information for all countries, which is 2011 population and 2011 quarter 1 GDP. For the post-98 period, in addition to the weighting exercise, EA-17 data from EuroStat are employed to construct the corresponding graphs.

3   Effects of Methodological Change

First, I checked whether we date the same peaks and troughs in GDP under the current methodology. If so, then we can conclude the methodological change has no effect on dating of previous recessions. If not, then controlling for different treatments of heterogeneity among the countries and matching the recessions for major economies might contribute to the analysis.

In the pre-98 period, the committee dated three recessions which are 74-75, 80-82 and 92-93 recessions respectively. When we evaluate those periods to date peaks and troughs, current vintage IMF data suggests slightly different stories for two of the recessions compared to the committee announcements as the following graph roughly suggests; however, the results stay identical among different treatments of heterogeneity and also does not align with any major economy's data which strongly suggests differences are not due to methodological changes but to data revisions.

Euro Area GDP Weighted GDP and Investment, 1970-98
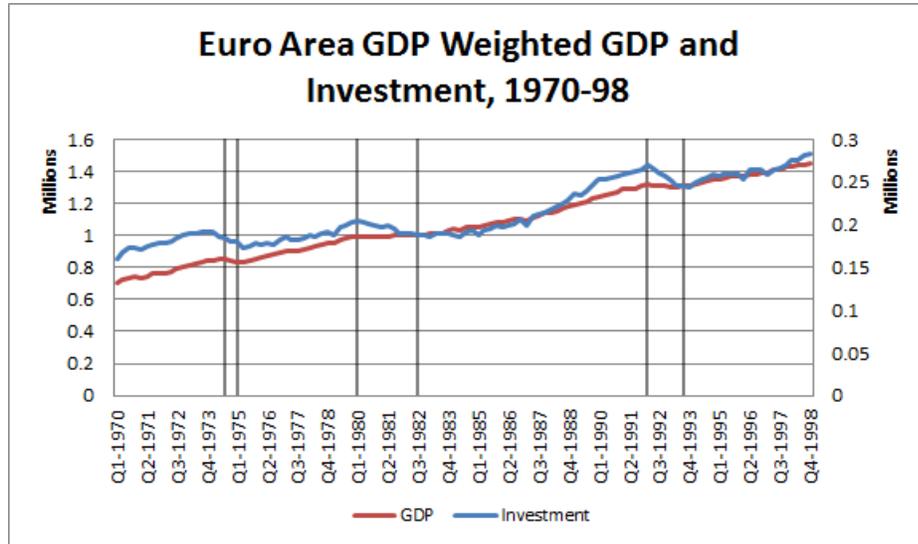
3.1 1974 Q3 - 1975 Q1 Recession

For the recession between the third quarter of 1974 and first quarter of 1975, the peak in 1974 is aligned with the committee announcement under all treatments of data. On the other hand, the observable trough in the second quarter of 1975 does not match the committee's announced trough in the first quarter when we consider GDP weighted summation of country GDPs.

All other treatments of data (different weightings) together with all countries' information (except France and Ireland pointing to a first quarter trough) suggest the same conclusion of a second quarter trough. Details of the alternative weightings are in the appendix. In addition to GDP information, investment also recovers after the second quarter of 1975 with an even more noticeable decline between the first and second quarters, which is shown in the following figure. Hence, this result seems to be data revision driven rather than methodological change oriented. More careful and proper treatment of the issue is possible with real time data for the first committee meeting but still it is safe to say that the decision for this recession does not depend on country heterogeneity.
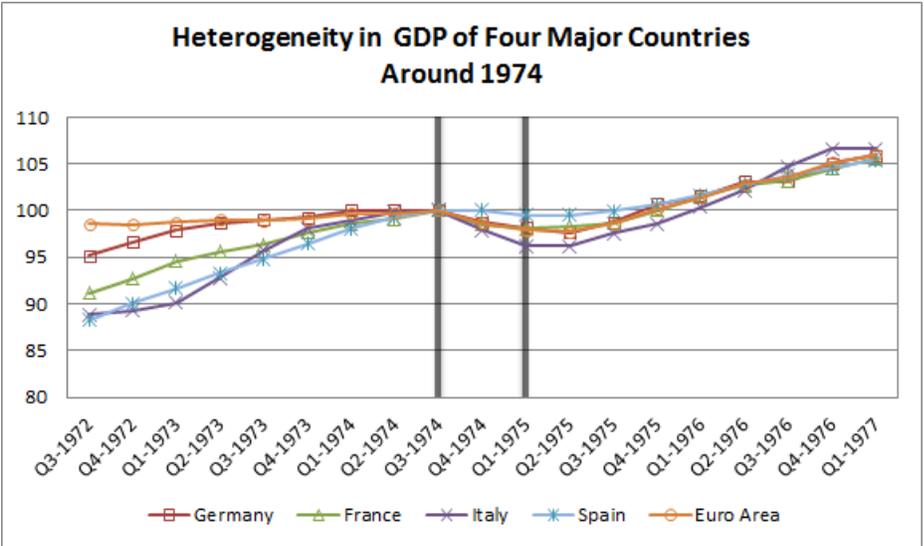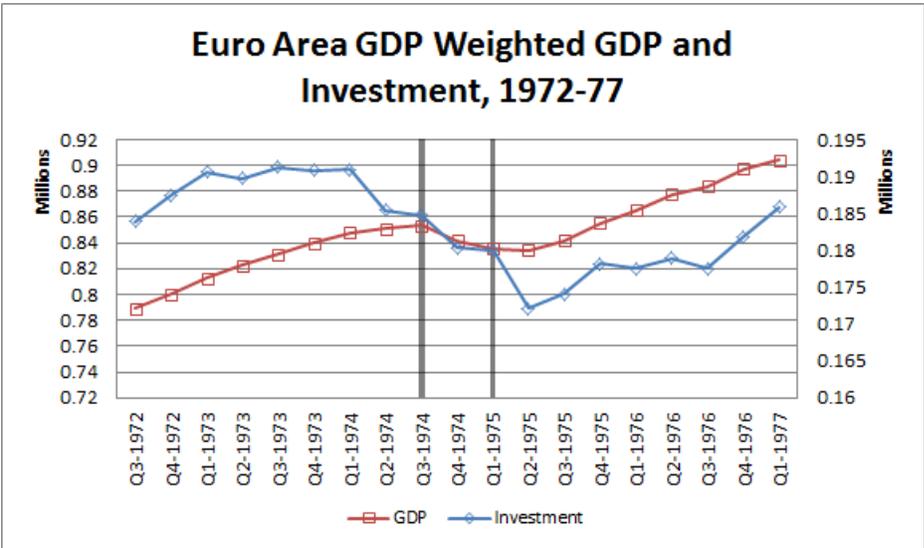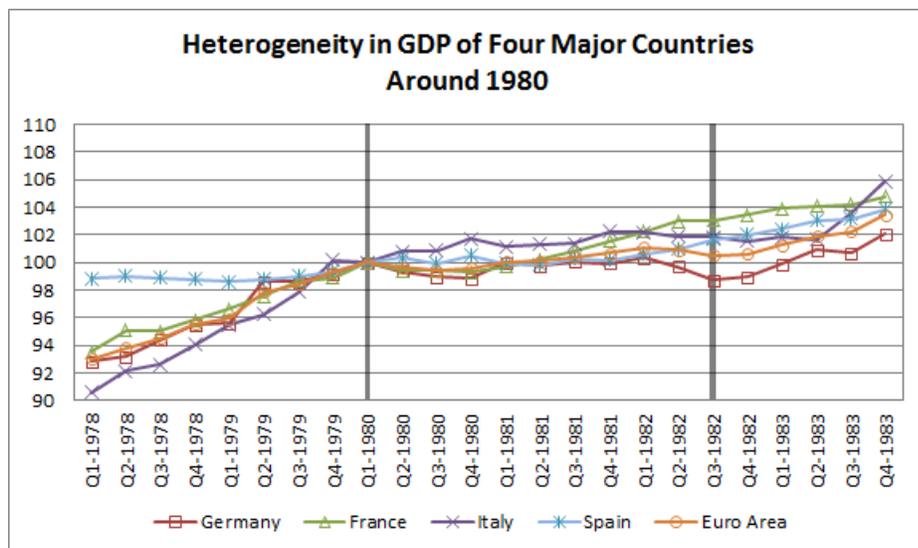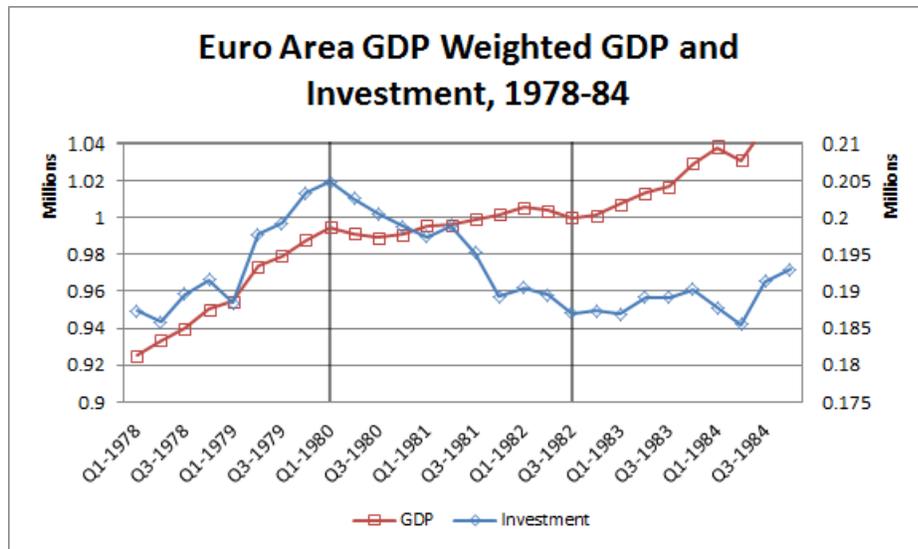
Euro Area GDP Weighted GDP and Investment, 1972-77

Heterogeneity in GDP of Four Major Countries Around 1974

*GDP at the time of the committee announced peak is normalized to 100 for all countries and the Euro Area data.

3.2   1980 Q1 - 1982 Q3 Recession

This period is characterized as a growth pause by the committee and the decision of peak and trough is highly dependent on investment and employment dynamics. On top of that, heterogeneity among countries is emphasized strongly by the committee for this recession. With this information in hand, when we consider GDP weighted GDP and investment data for countries as the next

graph does, we see the peak and trough are identified on the same dates as the committee announcement and also that checking for different heterogeneity assessments do not alter the results. Hence, the methodological change does not create any divergence between current dating and previous committee decisions for this period.


Euro Area GDP Weighted GDP and Investment, 1978-84

Heterogeneity in GDP of Four Major Countries Around 1980

*GDP at the time of the committee announced peak is normalized to 100 for all countries and the Euro Area data.

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3.3 1992 Q1 - 1993 Q3 Recession

The final recession before 1998 is similar to the 74-75 recession in terms of peak and trough choices. Current vintage data points to the same peak as the committee announcement but there is a slight difference in trough as our analysis suggests an earlier trough compared to the committee decision. However, as it was noted for the first recession, different treatment of heterogeneity does not alter this result and also except for Italy, all the countries GDP of second quarter is smaller than those in third quarter. Hence, there is no evidence on heterogeneity playing a role here and the difference seems to be driven by data revisions.
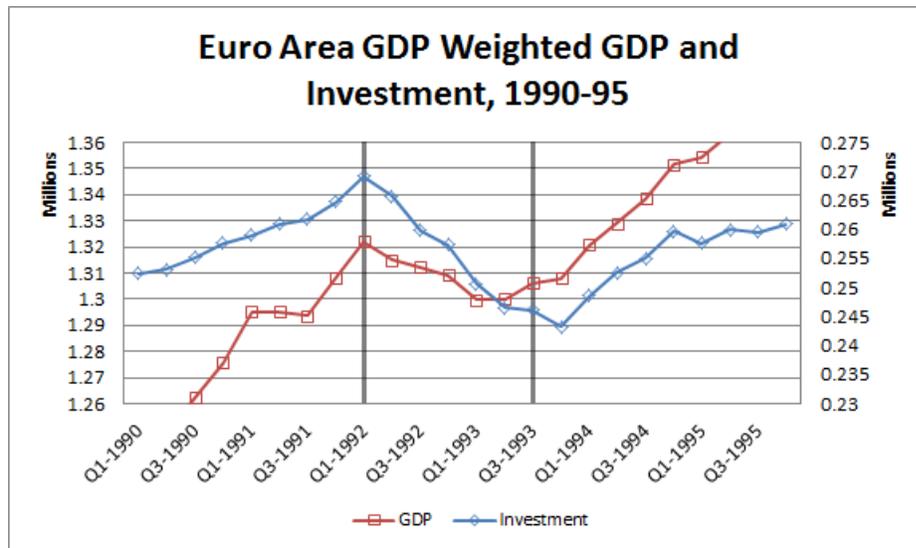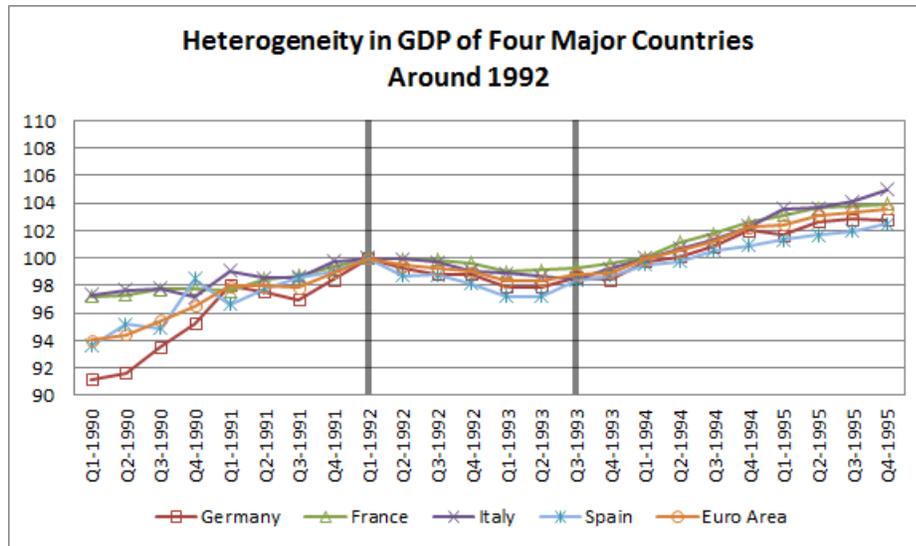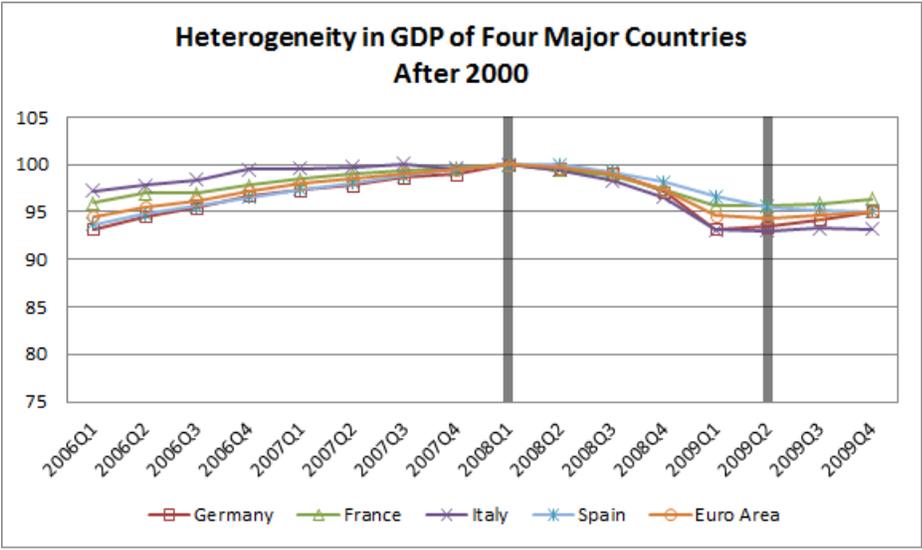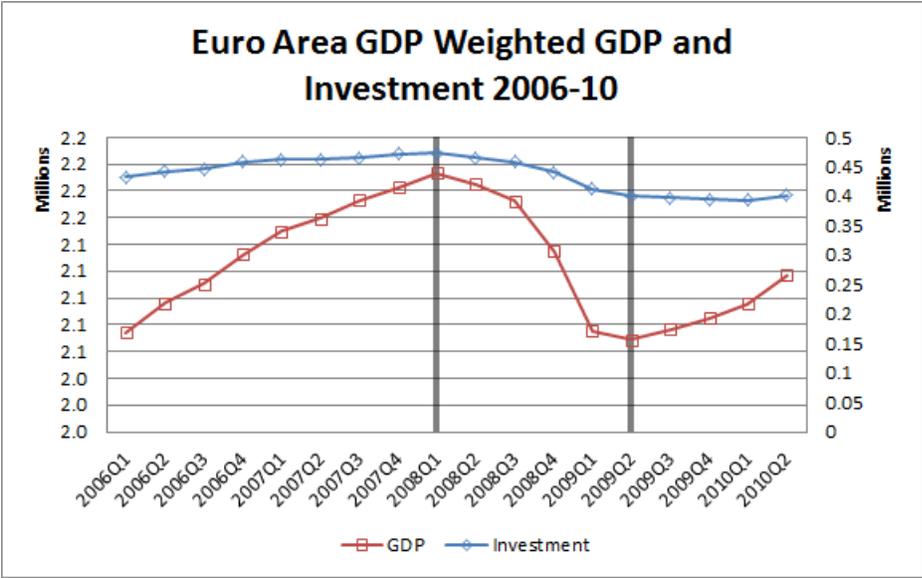
Heterogeneity in GDP of Four Major Countries Around 1992

*GDP at the time of the committee announced peak is normalized to 100 for all countries and the Euro Area data.

3.4 Post-98 Period

For the post-98 period, the committee identified 2008 quarter 1 as peak and 2009 quarter 2 as trough. With the current vintage of EA-17 GDP data, this decision remains the same and also is unaffected by different treatments of heterogeneity. Therefore, post-98 period evaluation of business cycles is not affected from the methodological change either.

Euro Area GDP Weighted GDP and Investment 2006-10

Heterogeneity in GDP of Four Major Countries After 2000

*GDP at the time of the committee announced peak is normalized to 100 for all countries and the Euro Area data.

4   Conclusion

As a result, when we work with the current vintage data, in two cases we find slightly different results for the timing of peaks and troughs than the committee's previously announced dates. However, as it was explained in the previous sec-

tion, these differences seem to be data revision dependent rather than method-
ological since different treatments of heterogeneity and country-wise evaluation
suggest consistent results among themselves.

Appendix

1974 Q3 - 1975 Q1 Recession

Simple sum and population weighted series of GDP and investment are represented below for comparison.
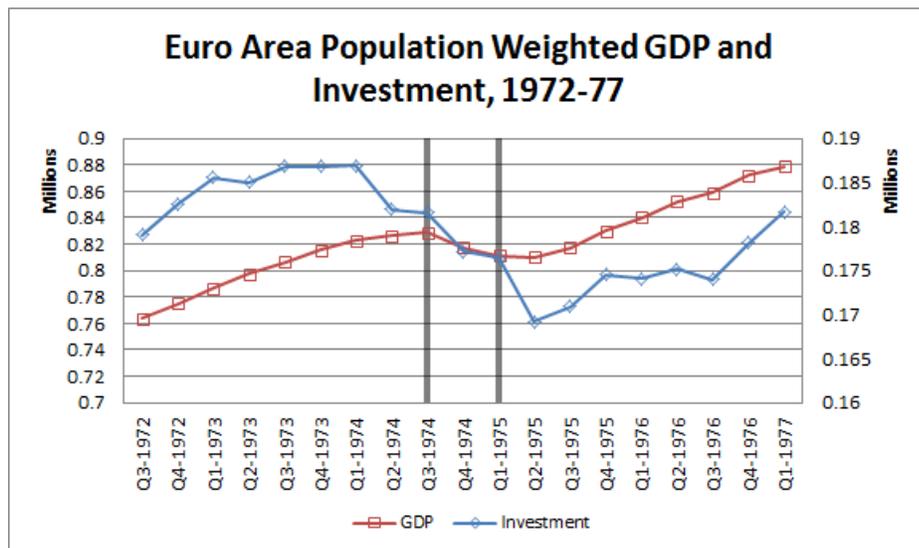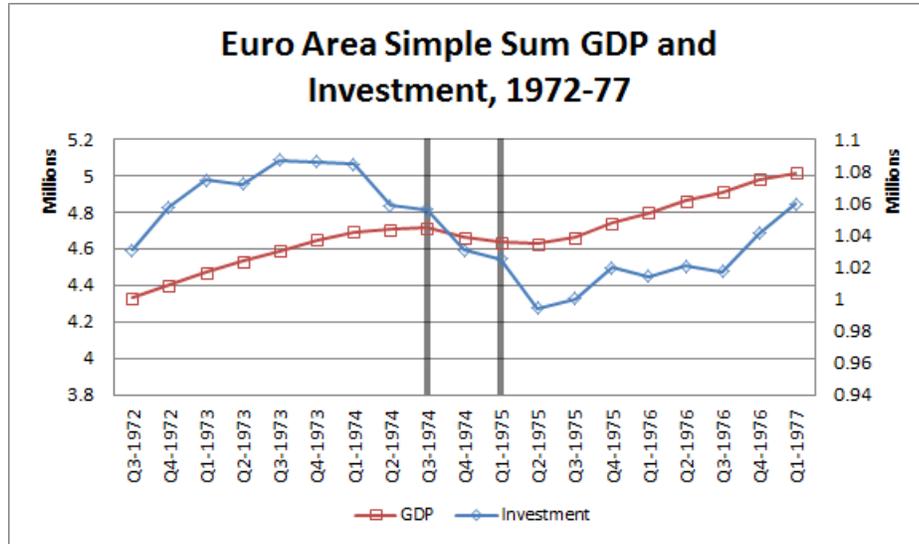
1980 Q1 - 1982 Q3 Recession

As before, other treatments of heterogeneity are shown below.

Euro Area Simple Sum GDP and Investment, 1978-84

Euro Area Population Weighted GDP and Investment, 1978-84
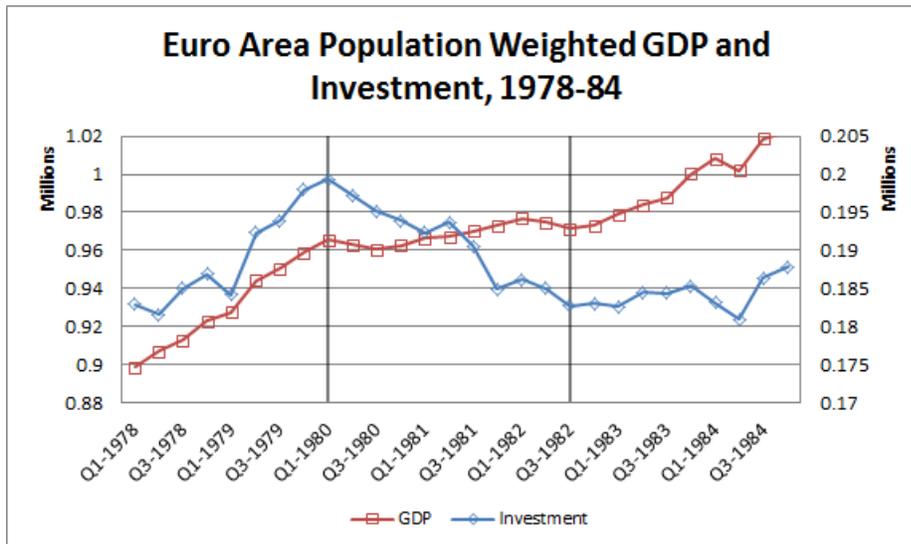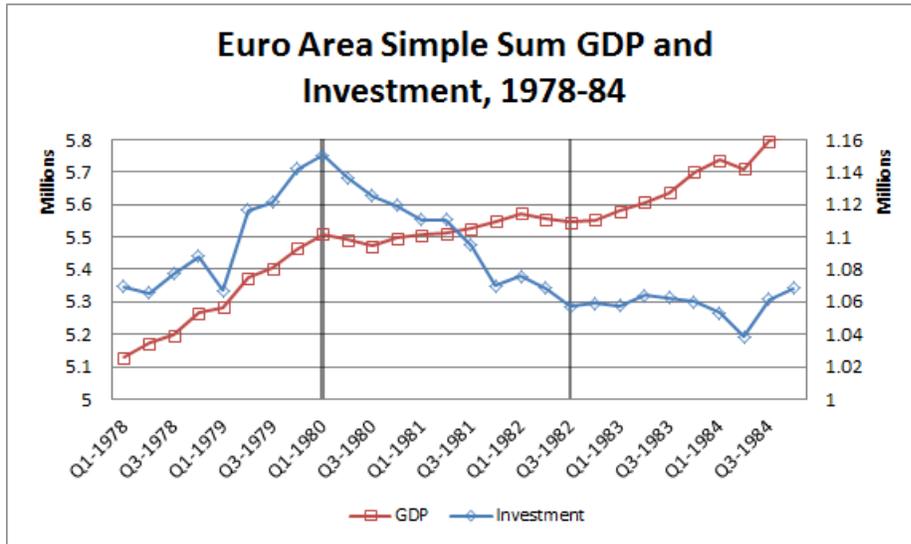
1992 Q1 - 1993 Q3 Recession

Simple sum and population weighted GDP and investment series for EA-11 countries and Greece are given below for comparison to GDP weighted series.

Euro Area Simple Sum GDP and Investment, 1990-95

Euro Area Population Weighted GDP and Investment, 1990-95
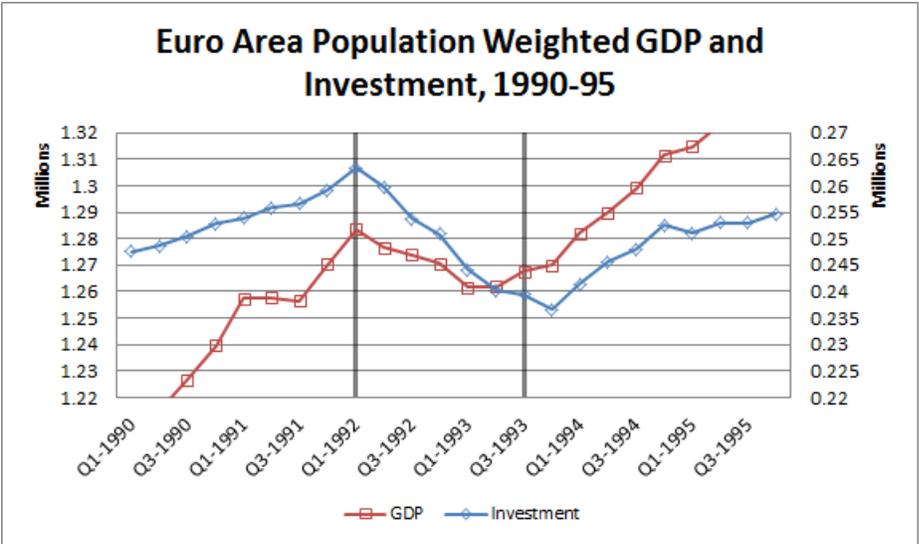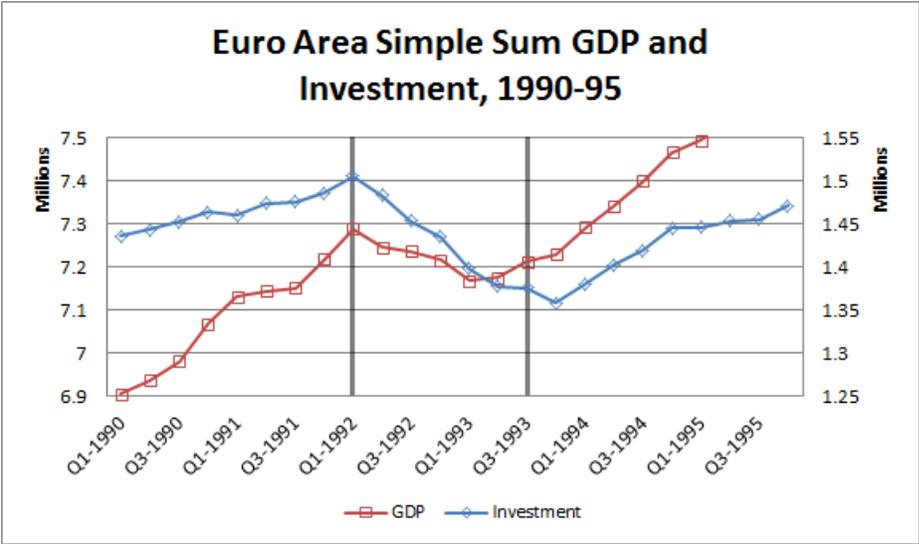
Post-98 Period

There is no difference between the committee announced recession and our findings and this result is independent of the heterogeneity treatment. Population weighted and simple sum series for GDP are shown before for completeness.

Euro Area Simple Sum GDP and Investment, 2006-10

Euro Area Population Weighted GDP and Investment, 2006-10

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