CompNet-ECB Workshop,
Lisbon September 18-19 2014

Main conclusions and follow-Up

Dear CompNet Members,

Below you will find a summary of the meeting. The final program and presentations are available on our website (http://www.ecb.europa.eu/home/html/researcher_compnet.en.html). Please be aware that presentations based on firm-level data, still preliminary, will not be uploaded in the web.

The main conclusions and follow-ups of the workshop are as follows:

- We aim at setting up a complete **research agenda** including all future working papers by the end of September. Projects will have the advantage of being able to use the novel data sets developed by CompNet. To this end, indicators computed across the three work-streams will be made available to CompNet members upon request and following insertion of a relevant project in the pipeline.
- All results of CompNet will be included in a final report – to be completed by mid-2015. The outline of this report will be distributed during the next workshop in December.
- We will continue with the "data validation" exercise. For WS1 this implies revising all the programmes computing the novel indicators and selecting a few of them to suggest for regular use to country teams.
- For WS2 validation will consist in a "plausibility exercise" both within the Statistics Department of the ECB, the coordination team at the ECB and single WS2 modules; by the first week of October we will select a few indicators/relationships which are statistically and economically sound and can be used for policy purposes. Such list together with a main assessment on the database of WS2 will be submitted for their endorsement to the Heads of Research by the 3rd week of October.
- We will set up a committee to start organising a high level conference to be held in June 2015, to close the CompNet.
- As for a possible extension of CompNet activities after mid-2015 - possibly limited to an annual update of the database - a proposal will be presented to the Heads of Research in their meeting on 11 December.

The workshop was structured as follows. Two keynote speeches, one by Fabio Ghironi (University of Washington) and the second one by Dean Corbae (University of Wisconsin) introduced two of the three plenary sessions were research papers were presented: Session I, focused on Monetary Policy and firm heterogeneity and Session III on Monetary policy, financial integration and firm/bank heterogeneity. A third plenary session was devoted to Global value chains and international trade. Besides, the first results of the efforts currently undertaken to validate WS2 data were presented in a fourth plenary session.

Additionally there were work-stream sessions during both days of the workshop. This follow-up starts with a summary of the plenary sessions and then moves to the discussions undertaken within each of the work-stream sessions. The overall perception is that all along the three work-streams we

are making good progress, particularly on the data collection and identification of policy relevant stylised facts. In the next few weeks we should concentrate our efforts on finalising the on-going research projects and write up the respective papers.

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Plenary sessions

Session I: Monetary Policy and Firm Heterogeneity

Keynote Speech: Fabio Ghironi (University of Washington), "The monetary policy implications of market reforms and trade regulation"

Fabio Ghironi raised two questions: (1) How does trade integration affect macro policy? and (2) How do reforms affect macro policy? To answer both questions, Ghironi and co-authors have developed a DGSE model with endogenous firm entry and labour market frictions (à la Pissarides and Mortensen). Both features are keys to replicate the observed business cycle co-movement across countries with strong trade links. This co-movement raises the case for stronger monetary policy coordination among trade partners. To answer the second question, Ghironi et al. calibrate the model for two economies, US and one with higher entry costs, unemployment benefits and collective bargaining power (Europe). If Europe reformed their economy towards the US, we would get lower unemployment, more investment but worse trade balance for some time (because more demand for employment is increasing wages, which appreciates the terms of trade, so you need to borrow to finance this expansion). This is different from traditional Keynesian models where reforms are modelled as cuts in wages or mark-ups which results in improvement of trade balance.

1. Iulia Siedschlag (European Commission): "Firm heterogeneity, access to external financing and firm growth"

   This research assesses the nature of financing constraints faced by enterprises in the EU over the recent period and the extent to which they are related to financial market imperfections (from the demand and supply side). Secondly, it analyses the effect of financial factors on investment, employment, productivity, and export performance over and above demand and cyclical factors. Thirdly, it identifies the heterogeneity of the effects of the recent financial crisis on the responsiveness of firm performance to financial factors across different types of firms and industries. The sources of data are SAFE, EFIGE and Amadeus. The econometric models are dynamic panel models estimated with a system GMM estimator applied to all firms as well as different types of firms (domestic SMEs, micro, young, middle-age, mature) and industries for the pre-crisis and post-crisis periods. The key results are summarised as follows: (1) Small and young enterprises are more likely to experience financing constraints; (2) Bank credit is more

important for small and young firms; (3) Small and young firms are more sensible to the interest burden on loans; (4) Short-term credit is more important to fund investment for young and small firms, relative to other types of firms; long-term credit is important, on the other hand, to hire new staff, particularly in the case of domestic SMEs and micro firms; (5) TFP growth is linked to increasing cash flows , especially for micro-firms; (6) Exporters are less likely to be financially constrained, while financing constraints do not affect the export intensity of existing exporters.

2. Hylke Vandenbussche (European Commission): "Firm level productivity and exporting: diagnosing the role of financial constraint"

This paper explores how financial indicators affect productivity and, if there is a role, how exporting is affected by these financial indicators, on top of productivity. To analyse these issues, the paper uses EFIGE data as well as national and sector financial framework conditions. Results are summarised as follows: (1) Local financing conditions matter in early stages of firms (to grow and become more productive) but later on, firms are less dependent on local credit conditions; (2) Export market participation is fostered by the downturn of local demand (critical determinant). Actually, that factor offsets the negative role in determining export market participation of the observed decrease in TFP during the crisis. The net result is that during the crisis more firms engage in exports.

- Discussion by E. Bartelsman (University of Amsterdan): The main current policy question is: why is investment lagging? Is it a lack of demand? Is it credit constraints? Is it secular stagnation? The variation across countries and over time, exogenous shifts in export demand and extensive margins of export supply should offer enough variation for identification in order to answer this important question. But this is not enough. We also need theory to disentangle causes and effects. More concretely, we would need models with heterogeneity and financial variables inside (starting now: Moll, Midrigan and Xu).

Session II: Global Value Chains and international trade

1. Rita Cappaiello (Banca d'Italia): "How does foreign demand activate domestic value added? A comparison among the major euro-area economies"

The development of multi-country production linkages has made more difficult to associate a country's production with the final demand that activated it since intermediates produced in one country can be processed in many other locations before they are ultimately exported and consumed (or invested) in the final destination country ("double counting" problem). In particular, the objective of the paper is to measure the impact on Italian GDP of a shock on foreign demand and to disentangle individual contributions both along a geographical dimension and a sectoral one.

2. Maria Silgoner (Oesterreischische Nationalbank): "The value-added trade weighted unit labour cost (TWULC) – An alternative for calculating real exchange rates?"

Empirical tests presented in literature fail to show the dominance of one specific indicator of price or labour cost to explain export performance, mainly because of the impact of growing interconnectedness and value added trade on competitiveness. The aim of this paper is to introduce a new real exchange rate indicator that gives more weight to sectors that actually export. The so-called TWULC and the related sectoral deflators (TWDEFL) are derived from weighting sectoral price or cost information according to their weight in value added trade, instead of using their share in total value added, as in conventional measures. Empirical and econometric evidence finds this indicator to be more related to export developments than the traditional ones. The data used come from the Socio-Economic Accounts accompanying WIOD (World Input- output Tables) and TiVA for a set of 38 OECD countries and 35 goods and service sectors.

- Discussion by A. J. Nagengast (Deutsche Bundesbank): With respect to the first paper, the discussant found that the 2014 Koopman decomposition underestimates the international fragmentation of production. Nagengast & Stehrer (2014) proposes a new expression that allows for intra-country processing and one single border-crossing from country 1 to country 2. With respect to the second paper, there could be a problem of collinearity of the indicators. One possible solution is to compute bilateral real exchange rates and perform analysis at the bilateral level. The discussant proposed as well several possible extensions of the analysis.

3. Giorgio Barva Navaretti (University of Milan): "Firms and aggregate trade performance (higher moments)"

The null hypothesis of this paper is that aggregate export growth depends only on the mean of productivity growth while the alternative hypothesis states that in addition to the first moment also higher moments are required to explain export growth. The empirical results, using CompNet firm-based data, indicate that measures characterizing the dispersion and asymmetry of the productivity distribution are actually highly significant in explaining export growth. Moreover, evidence is presented that a high degree of skewness of the productivity distribution is associated with a lower impact of exchange-rate shocks.

4. Carlo Altomonte (Bocconi University): "Trade in value added and multinational groups"

The paper is focused on how trade in value added is related to the presence of multinational groups (MGs) across countries, thus providing a first attempt at micro-funding the patterns of GVCs through FDI. The paper exploits a new decomposition of export flows at the triplet-level of home country-sector-partner level in 4 major value-added components, whose sum is equal to

the gross export flow. So, considering the "triplet" home country-home sector-partner country, the strategy is to first identify the business groups that are present in home country-home sector and in partner country (any sector) and then to compute the number of their nodes. This is positively associated to all components of trade and with the number of nodes in partner country in other sectors (vs. the home one); it is, instead, negatively associated with geographic diversification but it disappears when controlling for relative distance of countries. Data comes from worldwide proprietary linkages from the Ownership Database, and firm-level financial accounts from Orbis, both provided by Bureau van Dijk and focused on year 2010.

- Discussion by H. Vandebussche (European Commission): A key issue raised during the discussion is the simplifying assumption of symmetric consumer preferences in the paper. It was suggested to augment the structural model underlying the empirical analysis by asymmetric preferences over the set of products across countries. Asymmetric assumptions are more in line with the idea of different consumer tastes across countries and may therefore bring the model closer to the data. An additional important comment refers to the potential problem of endogeneity when analysing the impact of TFP-measures. In this context, it was suggested to establish a more solid causal relationship by following an instrumental variable approach. The paper of Carlo Altomonte et al. was too preliminary although very promising. Hylke suggested Carlo to publish a descriptive paper on the linked dataset used for this paper, given its novelty.

Session III: Monetary policy, financial integration and firm/bank heterogeneity

Keynote Speech: Dean Corbae (Univerity of Wisconsin), "Macro models with bank heterogeneity"

Dean Corbae presented his work on Bank market structure and prudential policy (prepared with Pablo d'Erasmo). They built a quantitative structural model with heterogeneity across bank size to assess the differential effects of regulation on the banking industry; one of the peculiarities is that the model endogenises bank size distribution by adding shocks to loan performance and dynamic entry/exit decisions. The author then showed how this model behaves when dealing with three policy counterfactuals: too-big-to-fail, higher capital requirements and restriction on global banking competition. In the first case, big banks increase risk-taking and small banks decrease their loan supply. Aggregate loans increase and interest rate decreases, which decreases bank entry. In the second case, banks rebalance their portfolios towards securities rather than loans, affording a lower profitability; the loan supply decreases and this increase in turn the level of interest rates. As to global banking competition, allowing global banks would result in less concentrated industry with lower interest rate margins, lower default rates, higher output and increase in welfare.

1. Diana Bonfim (Banco de Portugal): "The risk-taking channel of monetary policy – exploring all avenues"

The aim of the paper is to understand whether, during the accommodative periods of monetary policy, banks assume more risk; the analysis is carried out using bank loan level data. The results show that banks (especially the small ones) are more likely to grant loans to non-financial

corporations with recent defaults or without credit risk when interest rates are lower; loans granted under this accommodative monetary policy are more likely to default when the interest rate goes up again. The level of interest rate at the moment of the loan concession seems not relevant for the ex post probability of default of the overall loan portfolio.

2. Bernardo Morais (Federal Reserve Board): "Competition in the Mexican banking industry"

The dataset used for the analysis is at transaction-level, including all corporate loans of every commercial bank in Mexico from 2002 to 2012. A quantitative model where banks compete for customers a la Cournot is set up; the novelty of the model is that banks segment their costumers by geographic location, size and current bank affiliation. The results are as follows: (1) firms pay lower interest rates in the municipalities where the bank competition is higher; (2) interest rate to older firms is more sensitive to bank competition than to younger firms; (3) larger banks charge higher interest rates.

- Discussion by F. Carli (School of Business and Economics, Catolica Lisbon): As to the first paper, he pointed out that the focus was mainly on quantities (of the loans) and less on prices, which probably incorporate part of the economic risk. He also suggested a more detailed analysis of the loans portfolio ex-post. As to the second paper, he made some specific comments on the model (why are banks infinitely lived if there is no dynamic decision?) and noted that the model was actually general and not Mexico-specific.

Session on CompNet micro Database – proposed indicators and ongoing projects

The aim of this session was to compare and contrast CompNet data with other sources and obtain an overall impression of the plausibility of the dataset.

- Nicola Benatti (ECB-statistics) presented the results of the quality checks that DG-Statistics is undertaking on CompNet samples (of firm-level data). First he gave a brief overview of the questionnaires sent out to countries on the source and characteristics of the data and discussed which countries responded. He went on to discuss some minor caveats with the data and finally he proposed a variable-specific weighting approach.
- Paloma Lopez-Garcia (DG-Research, ECB) presented a set of stylised facts, related to aggregate productivity and TFP trends. The purpose of the presentation was to check whether CompNet data, aggregated at the appropriate level, could replicate those standard and widely-accepted economic facts, which they could.
- Matteo Iudice (DG-Research, ECB) presented the validation of the main indicators of the financial module: investment ratio, cash holdings, debt burden, collateral and return on assets. The module results were compared with those of the 2013 Structural Issues Report, based on the Amadeus data and the same statistical procedures. The results look promising: the magnitude of the indicators is the same in both datasets and also their development over time is often very similar. There are still some issues for some indicators in general (as

for the leverage, for which it is difficult to find a common definition among the two datasets) and for some indicators in some countries. A better cleaning procedure, especially on the Amadeus sample, could improve the comparison. Moreover, other sources of data should be used to make the validation exercise more robust.

- Antoine Berthou (Banque de France) gave a summary of the plausibility checks he has undertaken on the trade module. He compared export aggregates that emerge from the CompNet dataset with those in Eurostat, and with several country specific research papers. Overall, the results line up, with a few exceptions. In terms of trends, the module captures the 2009 trade collapse and the results on top exporters match those from other sources. Also, the exporter productivity premium is in line with expectations.

- Joao Amador (Banco de Portugal) started his presentation by giving an overview of the new code which features significant improvements in efficiency and clarity. Validating the results of this module is difficult as mark-ups are not available in other sources. Therefore, they focused on looking at the percentage of firms reporting negative price-cost margins and the results make sense. However, in terms of the price-cost margin of large and medium firms versus small ones, there is no clear pattern.

- Cristina Fernandez (Banco de España) explained that in the labour module one requires firms to be present in the sample for at least three consecutive years, which imposes a panel structure. Hence, the first thing to check is whether this restriction causes any bias. They find that it does not. The main validation they undertake is to compare the CompNet results with the labour force survey. In terms of employment growth they obtained very close results to the LFS although not everywhere, likely due to increase in the number of firms covered by the underlying data of CompNet resulting from improvements in data collection procedures. CompNet data has the same sectorial distribution of as the LFS but regarding size, there are too few small firms in some countries (FR, IT and DE). Finally, they compare the data with the OECD DynEmp data, showing similar results.

Discussions within the individual work-streams:

Work-stream 1

The feedback on the Compendium was in general very positive, although several critical comments were raised by the country desk economists – the final users of Compendium. A few suggestions for improvement were put forward during the discussion. First, given the broad and all-encompassing concept of competitiveness it was agreed on a small set of "anchor" variables which capture different dimensions of competitiveness related to economic growth, productivity and external development. The BMA-analysis should be updated by investigating the robust determinants of these "anchor" variables. Moreover, the robustness of the BMA-results should be assessed using alternative empirical methods. In addition to the statistical test by BMA, Compendium will include a policy-oriented evaluation grid for competitiveness. This will provide a distinction between

indicators directly linked to the "anchor" variables, and other indicators that are complementary to the understanding of competitiveness. Second, the policy use of novel indicators should be facilitated by an extended description of the "pros" and "cons" of these indicators and a potential elaboration of cross-linkages and interdependence between the various indicators. Third, two additional fiches (Trade weighted unit labour costs, complexity indicator) will complement the existing ones. In addition, boxes on firm-level data and value-added export market shares are expected to be included. Fourth, a text passage carefully reflecting on the definition of competitiveness will be included in the introduction of the Compendium.

Additionally, data validation was discussed. For the traditional indicators comments were mainly related to the description of indicators, definition of unit of measurement, and some suspicious data patterns for individual countries. For the novel indicators, there were some questions regarding the dynamics of RCA-indicators and sophistication index. Regarding the decomposition of export market shares it should be emphasized that factors other than quality and taste (e.g. globalisation) may play a role. The additional explanations will be added to the respective fiches.

As a general conclusion of the discussions, it has been agreed that the two-stage data validation process in combination with the proposed evaluation grid should facilitate the identification of a subset of indicators suitable for policy analysis.

Work-stream 2

WS2 sessions were partly devoted to present three new research avenues to be exploited with the new WS2 data. First, Vlad Demian of the ECB presented his on-going research project with Filippo di Mauro on the link between exchange rates, trade and productivity. Interestingly, they also investigate how the elasticity of exports varies depending on the sign of the change in exchange rates. Then, Antoine Berthou (Banque de France) gave a brief talk on his related on-going project on exchange rates which looks at the micro channels of adjustment and explores export performance by size/productivity class testing the hypothesis that larger/more productive firms are less like to respond to exchange rate adjustments.

The second research avenue is related to credit allocation across firms. Gerald McGuiness (Dublin City University) presented his paper on role of trade credit for small and medium enterprises and how that changed during the crisis. He argued that trade credit is more flexible and easier to obtain than bank loans so distressed firms may use it as a substitute for bank lending. He finds that the role for trade credit increased for vulnerable SMEs and that the importance of trade credit declines with overall credit. Finally, Fadi Hassan (Trinity College) shared his preliminary research program on the allocative role of banks and finance. He aims to fill in the gap in the literature on whether credit is actually going to the most productive firms and whether credit contributes to TFP differences. To carry out this program they would need, on top of the data already collected by WS2, extra data on loans, bonds, debts and share of capital from the CompNet participating countries.

Thirdly, Carlo Altomonte presented his thoughts on how we could match WS2 data with WS3 information. He explained that matching the data from the two work-streams presents two problems: (1) A "technical" problem related to the conversion of NACE Rev. 2 data into NACE Rev. 1.1 data at the 2-digits level. The issue is solvable since Rev. 2 data (21 sections, 88 divisions) are more granular than Nace Rev. 1.1 (17 sections, 88 divisions) so we could transfer everything to Rev.1 sectors; (2) an "Economic" problem related to how WS3 measures could be linked in order to exploit the wealth of variation in WS2 data. Here the idea is that country-industry-time-specific measures of value added trade retrieved from WS3 should be equivalent WS2 cells. However, traditional measures of VA trade currently used in WS3 (e.g. VS, VAX or the KWW decomposition) are *forward-linkage based*, meaning that they include indirect exports of a sector's VA via gross exports from other sectors of the same country. This generates some differences with WS2 measures that cancel out at the country level, but when considered at the country-industry level could be problematic. A solution could be to use *backward-linkage based* measures of VA exports, as they gauge VA from all sectors of a given exporting country embodied in a given sector's gross exports.

Module-specific discussions are summarised below:

Mark-up

In the markup module, which was joined by Eric Bartelsman, the discussion focused on a few points. First, several ways of assessing the sensitivity of results to outlier treatment were discussed. Second, as a first step in the analysis of the whole set of results from the code, some large differences in accounting price-cost margins were detected across country-sector cells, which were interpreted as signaling problems in the different databases, probably related to the definition of the variables or to the sample composition (biased by size, etc.). This issue if not properly addressed would call for making comparisons based on changes rather than on levels, which would not be as interesting. This topic was somehow worrisome as it affects the comparability of the different results computed in the markup module. Third, in view of the latter point, it was discussed whether making the whole analysis with the 20E sample would make the results more comparable across countries. This is an avenue worth exploring, but there may be a problem with the number of observations per country-sector cell. Finally, there was a discussion on how to structure the methodological/descriptive paper of this module.

Trade

During the first day of trade module discussion, Antoine gave the participants a preview of the slides he would show on the next day and went over the results. A large part of the discussion was devoted to discussing alternative sources of data validation, such as the World Bank exporter dynamics network. One proposal was using national sources of data, which would be undertaken by country teams, as these sources are in the country language.

Financial

The following issues, related to the code, were addressed: (1) Definition of depreciation rate (calculating the ratio over fixed assets instead of total assets); (2) Debt burden (to be computed also for the firms incurring into losses); (3) Mistake in retrieving country-specific thresholds for the Withed-Wu indicator. (1) and (3) are not so relevant given that the depreciation rate and the WW

indicator are not used in the analysis. As to the SAFE indicator, new results were shown. It was agreed that there has been an improvement compared to the past round of data collection given that the ranking of countries (from the most to the least constrained) is almost completely preserved. The open issues on the methodology, at the moment, are the use of the indicator for years previous to the SAFE survey and the small variation, year over year, of the percentage of constrained firms. A paper describing the detailed procedure for the construction of the SAFE indicator will be circulated among the participants in the next two weeks, in order to address the remaining doubts and make it a part of the financial module descriptive paper. As to the structure of the financial module descriptive paper, it will consist of a detailed description of the financial variables and indicators, as well as few applications and stylized facts.

Labour

The discussion was focused on data validation issues and future research projects. With respect to the former, the presentation that was to be given during the data validation plenary was discussed. CompNet matches the sector structure reported by the LFS in most countries (with the exception of Germany) but this doesn't hold anymore when the comparison is performed by size class (due to the low number of small firms included in the sample of countries like IT-ES-FR). Additionally, for some indicators, the number of firms with sufficient data is lower than the general firm-count. This is a problem that has to be taken into account. On future projects, the first outline of the descriptive paper (to be ready by December) prepared by Benedicta, was discussed. The paper on the merge between CompNet and WDN (plus other sources including institutional variables) was also discussed.

Work-stream 3

During the first individual work-stream 3 Session, the research pipeline was discussed and ongoing projects were updated. The latest version will be soon available on CompNet webpage. After that, J. Amador presented his paper with S. Cabral. This paper aims to measure the level of participation of a country in the Global Value Chain using a new methodology based on a threshold level of the share of imports (of intermediate inputs) and exports of a given country. The second objective of their study is to find a way to represent visually the Global Value Chain, connecting the different suppliers around the world within a single map showing the nodes of the chain. On this point, the work is still in progress and proposals on how to proceed are welcome.

Frauke Skudelny presented as well the paper "Crisis severity and international trade network." The main idea of the paper is to determine whether the position of a country in the trade network play a role for the severity of the crisis. Quarterly GDP data are used to define the crisis, while annual WIOT value added trade data to compute network indicators. The strategy is to evaluate impact of network indicators on crisis measures.

Thank you again for your participation! And thanks so much to the Bank of Portugal for this great workshop!

We are looking forward to meeting all of you in Frankfurt in December.

Filippo and the ECB CompNet team