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Speech by Yannis Stournaras, Governor, Bank of Greece

Micro data for monetary policy decisions: moving beyond and behind the aggregates

Thank you for inviting me to speak today on the use of micro data to support monetary policy decisions. A couple of years ago the topic would have looked surprising, to say the least. Monetary policy is about broad aggregates and the Eurosystem has a clear mandate to keep the eurozone's general price level stable without taking into account the distributional effects of its decisions. Since micro data are all about the distribution of income and wealth, their usefulness for monetary policy is far from obvious. Indeed it may look anachronistic. I remember the monetary policies pursued in many countries and in Greece until the 80s, where credit policies and selective credit controls were designed so as to channel funds to particular economic sectors (and even sub-sectors) while excluding other sectors from bank lending altogether. The implementation of these credit controls required a significant amount of micro data. For example, banks had to report not just total loans to non-financial corporations but loans broken down into specific categories like export trade, import trade and tobacco trade. The abolition of those controls brought about the abolition of this detailed micro reporting and its replacement with the reporting of aggregate balance sheet items. No one is suggesting a return to the micromanagement of the economy. Central Banks should remain focused on achieving their aim of price stability for the economy as a whole.

With the advent of the financial crisis, however, we have realized that aggregate data are not enough and policy makers need more granular data. This does not mean that there has been some sort of a change in the fundamentals of monetary policy objectives. Our focus continues to be macroeconomic variables and there is no going back to the detailed redistributive credit policies of the past. The use of micro data in today's monetary policy making serves a rather different purpose. Micro data firstly improve our understanding of the transmission mechanism of monetary policy and secondly allow us to better understand the aggregate data and thus better forecast their evolution.

These two aims actually imply that micro data do not only signify a move *beyond* the aggregates but also a look *behind* the aggregates. Micro data can either supplement

existing aggregate data or replace aggregate data with new data sets of better quality. Micro data can enhance the versatility of aggregate data, as they can be adjusted to accommodate financial innovation, regulatory changes or behavioral reactions to a changing economic environment.

Let me start by discussing how granular or disaggregated data can promote the flexibility of the data used for aggregate macroeconomic and monetary analysis. The main method for collecting monetary statistics is what we could name the 'balance sheet' method. Statisticians ask policy makers to specify their data needs. Once these needs are recorded, statisticians prepare templates that look similar to the balance sheets that banks publish. Users have to decide on these dimensions. For example, a template on loans can depict economic sectors on the columns and maturities on the rows. Users have to decide on the specific maturity bands they are interested in, enshrine them in regulations on the collection of statistical data and live with this decision for a long period of time. Changing the reporting templates is a difficult and costly process not only for central banks but for the industry as well. The Eurosystem is thus committed to keeping reporting templates fixed for at least five years. What can we do if we have reasons to believe that the instruments we include in monetary aggregates have to change, if the cut-off maturity band for money is not 24 months but 18 months? With aggregate data the only thing we can do is have patience, wait for the next round of amendments to regulations to take effect, by which time new changes may start becoming necessary. A good example of this occurred in my country in the years after 2000, when for various reasons, depositors moved away from ordinary bank deposits and started using repo agreements to an increasing degree. Eventually, this issue was addressed and corrected when repos were re-recognised as deposits, but there still remains an apparent break in the data that complicates the analysis and occasionally leads, even careful economists, to erroneous conclusions.

But with granular data, policy needs can be met immediately. Let me give some examples, where I expect the move to micro granular data to make a positive contribution to the quality and timeliness of monetary policy analyses and decisions. Let me discuss specific areas where micro-data can enrich our analysis and improve the quality of decision making.

Micro-data can be a way out of Goodhart's Law. Goodhart's Law states that as soon as the monetary authorities start targeting a monetary aggregate, this targeted aggregate starts misbehaving, as financial innovation leads to the creation of new financial instruments in an attempt to circumvent regulatory policies. With micro data, a policy maker should be able to follow such developments almost in real time and adjust the targets accordingly. Policy makers will have an easy way to check whether the altered behavior of macroeconomic aggregates is the result of fundamental economic changes or a form of regulatory arbitrage.

From Jensen's inequality we know that if behavioral responses to monetary policy are nonlinear, then the economy's response differs from the average economic agent's response as the variance of agents' characteristics increases. A more diverse economy (or increased inequality) impacts on the transmission mechanism. If the monetary policy instruments' impact on the distribution of agents' characteristics is small or unpredictable, then we can assume, at least as a good approximation, that such

distributional changes may add noise but have no systematic effect on the behavior of the economy.

Recently, there has been increasing reason to believe that this may not be the case. There is now an expanding body of research on the impact of nonstandard monetary policies on asset prices and hence the distribution of wealth. If such a relationship does exist, and if wealth impacts nonlinearly on spending and saving activities, nonstandard monetary policies affect the transmission mechanism. Having a richer set of granular data can help internalize the impact of monetary policy actions on wealth distribution and ultimately lead to a more precise modelling of the transmission mechanism.

A much longer line of research looks at the impact of wealth or credit constraints on the behavior of households and thus on the transmission mechanism. This is important in order to gauge how fast monetary easing will bear fruits by fostering demand growth. Micro data can help us go beyond aggregate Euler equations and have a richer analysis. We can identify the characteristics of households that are credit-constrained, but also how severe the constraints are. We can also examine the importance of various forms of wealth (housing or various financial instruments) and how closely households' assets and liabilities are aligned.

The Eurosystem has long understood the necessity of this kind of information and has organized the Household Finance and Consumption Survey that is conducted every 2 to 3 years. All euro area countries collect data at the level of the household on income, consumption, wealth and debt. The survey has considerably enriched our data on wealth. At the same time, answering the above questions requires micro data – at the level of the household and/or individual – since this allows for a more precise measurement of the impact of monetary policy on the real economy.

Although we are still in the process of analyzing the results of only the second wave of this survey, we can see that we have the raw material that can help us answer a number of questions. How does wealth feed into consumption behavior? Does the effect of wealth on consumption differ across households, depending on their age, whether they are homeowners or not, whether they have debt? As we move forward and complete further waves of this survey, we shall be able to infer some information on the dynamics of micro-data, and relate them to macroeconomic variables. Thus, it is possible to investigate the differential effects of asset price changes, consequent on a monetary policy decision, on individual euro area households. Thus rises in equity prices raise inequality, rises in house prices reduce it and the impact of changing bond prices is largely neutral.

The richness and diversity of economic structures across the eurozone has added complications, but also provided food for thought. An important outcome of conducting this survey simultaneously for the whole of the eurozone was that it forced us to align the operational definitions of micro variables across many countries, an exercise that will help us in the future when we collect other micro-data. It has also provided very concrete examples of how differences in economic structures have wider implications, like the impact of homeownership or population ageing on consumer and saving decisions.

While continuing the Household Finance and Consumption Survey (HFCS), we should integrate its results with the rest of macroeconomic data. An often unacknowledged secret is that in most macroeconomic accounts the household sector is treated as a residual for lack of comprehensive information. The HFCS should help us fill this gap and get a better grasp on financial relationships in the economy.

Another example of a micro dataset collected by the ESCB through the Wage Dynamics Network was a survey of firms in each country to determine their wage and pricing policies and their responses to shocks to demand.

The first wave of data was collected before the crisis and sought to investigate wage and labor-cost dynamics and their relevance for monetary policy. These dynamics have implications for how firms and ultimately the real economy in general respond to economic shocks. Thus, firms were asked how often they change wages, how they judge by how much wages should change, whether changes in wages then feed through into price changes, the institutional framework of wage bargaining along with the degree of competition in the sector in which they operated. The current wave is focusing on the labor market reforms that have occurred in a number of countries during the crisis in an attempt to determine whether reforms are associated with a change in wage-setting behavior. It can thus help us understand to what extent the crisis has affected microeconomic behavior, in particular by inducing greater price and wage flexibility, and to what extent such changes impact on the transmission mechanism.

As a final example of the growing importance of micro-data, let me remind you of the Governing Council's decision a few weeks ago to proceed with the collection of granular, loan-by-loan, credit data, the already famous AnaCredit project. This project, complementing the existing Securities Holding Statistics (SHS) database, will allow us to have a quite detailed view of the corporate sector's liabilities and the way they are managed. This will allow a much more granular analysis of the impact of monetary policies and relate firms' behavior to a host of microeconomic and financial variables, such as size, credit worthiness, sector of the economy and so on. We hope to be able to have a more complete and nuanced answer to questions that perplex us, such as what is holding back investment at the zero bound, and what is needed to kick start the investments.

Having spent all this time presenting the potential benefits of micro data for monetary policy making, I feel an obligation to warn that it will not be plain sailing ahead. We have to work hard to resolve many issues that will unavoidably arise.

First of all, we should deal with concerns that we are creating "Big Brother". Granular data, almost by definition, cause concerns about safeguarding personal information. Most granular data of interest to central banks are about corporate entities. They do not contain sensitive personal information, but often they contain important market-sensitive information. Even so, improper use may be detrimental to some, or they may be used as a coordinating device in an oligopolistic setting. To some, such concerns may look like a nuisance that should not become an obstacle on the road to a bright new future of "big data". This would be a mistake. It will only raise suspicions and lead to a worsening of the quality of the data. Central banks should be in the forefront of

developing best practices and adequate safeguards that allow the use of such data without impinging on individuals' privacy.

Second, we should be aware of the risk of drowning in a sea of data. As Nobel laureate Herbert Simon put it: 'A wealth of information creates a poverty of attention'. The rather obvious characteristic of micro data is their size: micro data by construction are an overwhelming amount of information. It is important to look not only at the benefits of micro but also at the risks for policy makers. The risk is that policy makers are bombarded with too many numbers and, as a result, decision making is delayed.

A simple example can elaborate this point. Consider one of the key variables monetary policy monitors, M3 growth. The aggregate data on M3 is just one number or one time series, say 12 monthly observations. What are the corresponding micro data? One possible disaggregation of the aggregate is to look at the 6,000 numbers describing the evolution of specific types of deposits in every single credit institution. What can policy makers do when confronted with, say, 6,000 numbers? Not much. Perhaps they will set up a task force to examine the data and come back with a report in a month or two.

It is important to note that policy makers do not and should not really use micro data. Consider, for example, the micro data collected through the Household Consumption and Finance Survey I have mentioned before. Are policy makers supposed to dig into these mass of data? Of course not. The idea is to channel these data into statistical models that can produce interesting and useful summary statistics and uncover relationships which are important for policy success. Policy makers should ask to see a picture of the whole forest, not a list of trees and should transfer to statisticians and economists the task of developing models and summary statistics that will follow developments and provide answers to their policy concerns.

In order then not to lose sight of the forest, economists and statisticians must have clever tools that allow the proper manipulation of the micro data. Policy makers must demand useful information squeezed out of the micro data so as to gain a better insight on the aggregate data. Is M3 growth for real, or just the artifact of regulatory arbitrage? What is driving its growth? Is it a widespread phenomenon or a few special outliers? What is behind a surge in credit? A few large corporations or many SMEs?

The point is that statisticians have their work cut out. We do not just ask them to collect the biggest amount of data and store them somewhere. We ask them to develop clever, versatile tools that can provide intelligible answers to policymakers' queries. Clever tools are thus necessary, if policy makers are to profit from granular data. You are all familiar with the famous computer principle 'garbage in, garbage out'. The problem with micro data is not to end up in a situation where lots of good quality information goes in but nothing comes out. In order to be able to manipulate micro data we need two things: common identifiers and reference databanks. These are necessary in order to organize all this huge information in an efficient way, so that it can be manipulated to produce the answers to the questions asked by policymakers.

As I mentioned before, the extensive use of micro data by central banks is shifting the compilation burden from reporting institutions to NCB statisticians. It is thus necessary

to provide to our statisticians adequate resources so that they can cope with the additional demands placed on them.

I can see that we stand at the start of a period where central banks, like everyone else, will make use of “big data” and we should learn how to use them to maximize their benefits. While these potential benefits are large, the effort needed is equally significant. We need to invest in information technology infrastructure, but we also need to educate our statisticians how to deal with the new larger and more complicated data sets. The costs will be high and will fall mainly on the central banks. Instead of receiving readily usable processed information, we are beginning to demand from reporting agents huge amounts of granular information that is then processed in-house by our statisticians. There is a need to streamline the process of collecting data. In particular, we should exploit to the maximum synergies between the collection of supervisory and (traditionally) statistical data, by developing common definitions to the extent possible, or simple rules to transpose the ones into the others.

Central banks are leaving the small safe harbor of simple, aggregate data and are opening up to the brave new world of granular big data. In order not to get lost, we need new skills, more crew, that is statisticians, and stronger vessels, that is better and more versatile models. We hope that in the end we shall reach the island of (price) stability.