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Mid-term workshop 3

"Measurements and official statistics in a future-oriented perspective"

5 March 2020

Blanquerna School of Communication and International Relations

Ramon Llull University, Barcelona, Spain

ISTAT

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Mid-term workshop 3

Summary

The third mid-term workshop of the project took place on 5th March 2020 at the Blanquerna School of Communication and International Relations - Ramon Llull University in Barcelona.

This workshop represents the fifteenth milestone of MAKSWELL Project. The event was intended to give an opportunity to disseminate the research results of the project but also to present other ongoing EU-wide research activities related to MAKSWELL themes to a targeted public and to all the viewers from all over Europe, which had the possibility to follow the streaming of the event.

This report summarises the main contents of the presentations given in the workshop and tries to provide some insights on future research needs and on how SDGs and well-being indicators can be used for policy making in a more effective way.

The original agenda of the workshop was subject to significant last minute cuts and changes due to the Covid-19 outbreak, which imposed some restrictions to travels all over Europe. For this reason, it was not possible to organise the round table. Some presentations were provided on line and only few persons could attend the event. Nevertheless, the main project results were presented and the exchange of views with other ongoing research activities on the same themes was very fruitful.





Index

INTRODUCTION
1. Aim of the Workshop
2. Agenda 6
3. Project state-of-art
3.1. Opening – (Oscar Mateos, Blanquerna-Ramón Llull University, Spain)
3.2. Welcome and overview of MAKSWELL project – (F. Bacchini, Istat, Italy)
4. Session 1: main project results 11
4.1. New challenges for official statistics and indicators for policy makers - (M. P. Sorvillo, Istat, Italy)
4.2. Insights on statistical methodologies and new data sources for SDG and well-being indicators - (J. van den Brakel, CBS, The Netherland)14
4.3. Using Alternative Spatial Data Sources for Small Area Estimation – (N. Tzavidis, University of Southampton, United Kingdom)
4.4. (Monetary) Poverty lines and local price levels – (S. Marchetti, University of Pisa/Camilo Dagum Centre, Italy)
5. Session 2: on-going EU-wide research activities related to MAKSWELL project themes
5.1. How to translate cultural and language-related factors into social indicators to measure discriminations and its effects on inequalities (V. Bello, Blanquerna-Ramón Llull University, Spain)
5.2. Atlas of Household income distribution (ADRH) (A. Argüeso, National Institute of Statistics,
INE, Spain)
6. Conclusions
Annex 1





INTRODUCTION

MAKing Sustainable development and WELL-being frameworks work for policy analysis (MAKSWELL) is a co-ordination action project financed in the EU Horizon 2020 research and innovation programme. The project, coordinated by Istat with the partnership of other three NSIs (CBS, Destatis and HCSO), three Universities (University of Trier, University of Southampton and UNIPI) and a non-profit entity focused on public management and organisation (Consorzio MIPA) started its activities on November 2017 and will end on April 2020. MAKSWELL aims to extend and harmonising the indicators able to capture the main characteristics of the beyond-GDP approach proposing a new framework that includes them in the evaluation of the public policies. At the same time MAKSWELL would like to improve the most appropriate traditional indicators available using the new data collection tools and modern statistical methods to have timely and accurate data. The work plan is shaped around 8 work packages (WPs): 5 research WPs, a WP on management, one on communication and dissemination and one on ethics issues.

Focusing the attention on the research activities, the aim of WP1 is the analysis of the frameworks on well-being and implementation of the Sustainable Development Goals at national and international level for policy making. WP2, WP3 and WP4 focus on methodological issues related to the use of new data sources and their integration with traditional data (registers, survey data), especially where there are data gaps. They deal with the production of local estimates of poverty and living conditions and development of multivariate time series models for Sustainability Development Goal indicators (SDG's) and welfare indicators. The aim of WP5 is to extend the results of the previous WPs providing tools for policy making also through of a pilot study for Italy and Hungary.

Within this framework, MAKSWELL mid-term workshop 3 entitled "Measurements and official statistics in a future-oriented perspective" focussed not only on the results already carried on in Work Packages 1, 2, 3, 4 and 5 but also on some measures of innovative study to address to and support policymaking. It was hosted in one of the most prestigious and high level Universities in Spain, the Blanquerna School of Communication and International Relations - Ramon Llull University, located in Barcelona.





1. Aim of the Workshop

The planning of the third MAKSWELL Workshop on 5th March 2020 was established on the main aim of task 6.4 within Work package 6 "Dissemination and Communication activities of project results", which is the discussion of the actual information needs of users/communities for making explicit the way the statistical information proposed may effectively enter into the decision making process, for developing the best forms of data dissemination. It also responds to the key objective of WP6 to build up knowledge through the contact and reciprocal fertilization of NSIs, academics and stakeholders, identifying and contacting key practitioners to participate in debates and discussions. In fact, it was a fruitful occasion to share the research experiences and encourage the floor discussion with invited keynote speakers and the audience, present physically and in remote connection, because difficulties already raised due to some restrictions connected to the sanitary emergency related to the outbreak of Covid-19.





2. Agenda

	#2 MAKSWELL Workshop	MAKSWELL Market States and development and Will being the exception work for coding a realized	
#3 MARSWELL WORKShop Measurements and official statistics in a future-oriented perspective			
Barcelona, Thursday March 5, 2020 Venue: Blanquerna School of Communication and International Relations - Ramon Llull University Joan Coromines Square - 08001 Barcelona			
9:30-9:45	Registration		
9:45-10:00	 Welcome and overview of MAKSWELL project Fabio Bacchini, MAKSWELL Scientific Coordinator, Head of Division 	Istat, Italy	
10:00-11:00	 Session 1: main project results New challenges for official statistics and indicators for policy makers Maxin Dia Constillation (Division) 	T-b-b Thefe	
	 Insights on statistical methodologies and new data sources for SDG and well-being indicators Jan Brakel, Senior Statistician and Extraordinary Professor of Survey Methodology 	CBS, The Netherlands	
	 An application of poverty estimation with remote sensing data Nikos Tzavidis, Professor of Statistical Methodology (remote connection) 	University of Southampton, UK	
	 (Monetary) Poverty lines and local price levels Stefano Marchetti, Professor of Statistics (remote connection) 	University of Pisa - Centre Dagum, Italy	
	DISCUSSION		
11:00-11:20	Coffee break		
11:20-12:00	 Session 2: on-going EU-wide research activities related to MAKSWELL project themes How to translate cultural and language-related factors into social indicators to measure discriminations and its effects on inequalities Valeria Bello, Associate Professor in Sociology 	University Ramón Llull, Barcelona, Soain	
	Atlas of Household income distribution (ADRH) Antonio Argüeso, Director of Socio-Demographic Statistics DISCUSSION	National Institute of Statistics, INE, Spain	
12:00-12:45	Roundtable on advancing the measurement and policy use of well-being and sustainable indicators in the policy agenda		
	Chair: Valeria Bello David Ferroni – MAKSWELL Project Officer remote connection Fabio Bacchini	European Commission Istat Italy	
12:45-13:00	Closing		





Proceedings

3. Project state-of-art

3.1. Opening – (Oscar Mateos, Blanquerna-Ramón Llull University, Spain)

The 3rd Mid-term workshop of MAKSWELL was opened by the words of welcome of Professor Oscar Mateos, as representative of the Blanquerna School of Communication and International Relations, Ramon Llull University, high level academic Institution well-established in Barcelona and recognized for its high quality academic status across all the Spanish territory, which hosted the event in its premises, making also available a live streaming of it, thanks to its IT staff and the IT equipment it was provided of.

He underlined the fact that as School of Communication and International Relations since last years they have started to foster any type of research collaboration with other different partners. Hosting the interesting MAKSWELL project workshop in Horizon2020 Programme was seen since the beginning a very fruitful occasion to stay in touch with such a relevant Institution as the Italian Statistical Office and to learn from the project's outcomes so far. A future collaboration in another project or other jointed work was also hailed as a positive prospective, too, coming from this relationship. As a School of Communication and International Relations a lot of programs are focused on communication subject but the offer in the field of international relations is increasing: last year there was the first undergraduate program for Global Communication Management but different programs on masters, doctorates and research are scheduled.

He thanked the speakers involved and the audience present in the auditorium for coming, understanding that for many others there was impossibility to join due to the outbreak of the COVID-19 and its sanitary emergency. He then gave the floor to Fabio Bacchini.

3.2. Welcome and overview of MAKSWELL project – (F. Bacchini, Istat, Italy)

Fabio Bacchini started addressing words of thankfulness to Prof. Oscar Mateos and Prof. Valeria Bello as representatives of the University Blanquerna - Ramon Llull in Barcelona for hosting the event and make available for the operative run of it a very comfortable Auditorium, well equipped with audio and video devices in order to give the possibility to follow the workshop in live streaming also to all those not able to join due to sanitary emergency caused by COVID-19 outbreak, which begun to have an impact on some working activities.

He then passed to give his presentation on MAKSWELL project state-of-art. Taking the cue from the explanation of the acronym of MAKSWELL which stands for "MAKing Sustainable development and WELL-being frameworks work for policy analysis" he described his intention to explain more in detail the idea on the development on the two topics i.e.: 1) well-being and sustainable development and 2) their connection with the policies, considered very important. In order to reach this goal he would have also tried to present some of the questions the research team is trying to face within the project.





Concerning the project *strictu sensu* he gave some elements about the network at the ground of its compositions: 4 National Statistical Institutes (NSIs) i.e. the Italian National Institute for statistics as coordinator, the German one (Destatis), the Hungarian (KSH) and the Statistical Institute of the Netherlands (CBS); the other components are 3 Universities (Southampton, Pisa, Trier) from the world of academia and MIPA, a non-profit entity in Italy for the development of methodologies and innovation for the Public Administration.

Concerning the motivations of the project, there was at the base the idea to try to see across European countries what is the impact of well-being measurements and SDG as well on the public policy. In the first Work-Package a sort of survey was made across European countries to see how the well- being and the SDG framework has been adopted by the NSIs and inside the public administration. All this with the objective to see if this framework meant to measure the Beyond-GDP system could also work for policy issues. Passing to the second and third point, he highlighted that, focusing the interest on these two themes: Well-being and SDGs, the research work was centered on the issue if the actual system of measurements is quite good or it could be improved by different set of data, for example big data, or could be improved by different methodologies (e.g. small area estimation could improve some measures on poverty at territorial level). The final part of the project is represented by motivation 4 and which concerns the question if all these measures and improvements in data and methodology could be of some importance to better address the impact of the policies on well-being and the SGDs. It is showed through a cake graph that the project is almost at the end having reached a progression of 92%, so the time has come to summing up along the last phase all the things collected to finalize the last reports.

He then went on analyzing some data which were part of WP1: the main issue was if well-being and SDGs are important, if there is some framework that is able to capture these dimensions. In the table the answer collected across Europe is showed and it is nr. 28. The point is the in 19 European countries there are some frameworks related to well-being measures. Another significant point is that in 11 countries all this system tries to be related to the political dimension. It is also relevant to stress that 12 out of these 19 countries try even to relate the well-being measures at territorial level. All the statistical system is not so able to capture territorial evidences at least with a short delay related to the data.

Switching on analyzing SDGs there is a slight different scene as SDGs share a common framework across all economies and across all countries in the world, so this means that basically all European countries are related to SDGs measurement system and most of them (21) try to relate SDGs to the policy dimension. Substantially, both of these frameworks are very important for all the European countries.

Then followed a focus on the well-being framework that are not standardized across the European countries. Concerning this, it was explained that in the study there is a tentative to make a comparison, the idea of which he presented as follows: basically all the systems try to share a common approach that is almost the same as that proposed by OECD: across all the countries a modification can exist but basically there is a common part for all the dimensions of the well-being.





There is the opportunity to suit together all the dimensions of the well-being across European countries. What is needed when working together is some improvement in the standardization of the indictors because these indicators sometime share a common survey (i.e. all the indicators related to the labour market) but there is uncertainty on the fact that the implementation inside this framework is able to derive some common indicators. There is some homogeneity in the conceptual framework but there is not certainty that the same homogeneity should be on the final indictors of each system.

As regards the importance of well-being fot the policy he gave a couple of suggestions: 1) a key event within this issue is the two-days meeting organized by OECD entitled "Putting Well-being Metrics into policy Action". From MAKSWELL project perspective two things were to consider important in this high level meeting. The stress is to put on the word "metrics": the idea is that, compared to GDP, both well-being and SDGs frameworks don't share the same metrics. From a study of Corado et al. there is a problem of additivity if we try to talk, making a comparison with the GDP, because when talking about GDP there is the opportunity to have at least two main properties: additibility as well as not duplication. Probably there is not a common agreement to have additivity for well-being and SDGs but the most important point is that there is the need for a sort of metrics that tries to consider together all these indicators. Otherwise, there should be some problem concerning the impact of the policy measure on the framework to modify.

Concerning the well-being, Italy is one of the most advanced countries because they try to relate the well-being indicators (at this stage 12) to the policy dimension. Whit this respect it was showed a screenshot taken from the homepage of the Ministry of Economy and Finance where there was in highlight the report on BES for the year 2020 published only two weeks before (BES stands for "Benessere Equo e Sostenibile" that is the Italian for well-being). This means that every year the Ministry of Economy and Finance has as mandatory among its scheduled appointments to provide the publication of this report. This means that there is the need to provide the policy measures developed across the year and the daily impact on the selected well-being indicators. But this analysis is quite difficult because there is not a linear relationship, as not always there is one indicator for a policy measure. Thinking about the poverty dimension in Italy for example, there is not certainty about the fact that the measures put in place are sensible to the poverty indicator used to measure that problem. What can be said is that this is a quite good and important work but it is very hard to measure as well as it is very hard to build up a system where all the different aspects could be put together.

At this point he hinted at the "Policy Cycle" Stiglietz et al. were already referring to in a study in 2018. It is driven by the well-being measures, passing then to describe what is the effort and the main aim of this issue. Usually but especially within European Commission the most important dimensions are the so-called "core indicators" and the report on the economic situation for one country is mainly driven so far by the analysis of the economic measures: GDP, the debt, the unemployment rate (although this last could be also considered as one social indicator). He added that it is most important to reflect on the fact that if you want to change the way in which you try





to asses on the position of one country you need to assess both on the economic situation as well as on social dimension. In order to do that, there is the necessity to change at least the list of the indicators considered in one's own policy dimension. In the example offered by Stieglitz study it can be noticed that to define the "Policy Cycle" all the policy measures are related to the well-being indicators. This, in his opinion, can be considered a relevant scheme because it helps to define all the "Policy Cycle", not only the ex ante evaluation that could be done by policy measures but also the ex post evaluation, with the request in this last case of a major effort, thing that even in Italy is not easy today to carry on. At the end of the story it will be important to know if public money has been devoted to something that has revealed useful to the progress of the society.

Back to more specific issues related to MAKSWELL project he described the important final steps represented by the outputs due in the last phase of the research activity. It is mostly a work based on tracking and summing up the future research needs. In such work the project's legacy for the future could be seen, concerning above all on the improvement of the methodologies and on multivariate analyses on wellbeing related to the so-called MIP (Macroeconomic Imbalance Procedure). These, in particular, are the indicators used by the European Commission to make the assessment on the evolution of each European Country. With respect to the "Reflection Paper", this output was meant to be released in the last phase of the project but it was asked by the EU Project Officer to be anticipated almost at the beginning of the activity in order to give an insight in view of the presentation of the new European programme "Horizon Europe". What the project could do in this last part of its work is surely a reflection of the "Reflection Paper", in a way to refine what are the ideas of the Consortium for the next agenda for research. At last it was mentioned also the report concerning a pilot study and recommendations for stakeholders. The idea it that as during the research the improving of methodologies was attempted at as well as that of data collection and all these should be related to improve the ability from the political system side to relate the efforts to the well-being and sustainable development indicators.

The last part of his presentation was centered on the theme of MIP. He showed a table with the "core indicators" that European Commission refers to in order to make the evaluation of a country. Something important to stress on about it is that together with these "core indicators" in the last few years even the European Commission has made an attempt to improve the set of indicators they use to make the assessment. In fact, there is an improvement on the social indicators and all the measures on poverty and unemployment are now considered very important even for the MIP approach. This to show how this approach, even using the so standardized auxiliary and core indicators could be easy to check for the evolution across the European countries, i.e. if European efforts are devoted to a higher level of cohesion across the countries or not. On this purpose he showed the results of a Principle component analysis through two graphs where "core indicators" for all the 28 European countries are represented before the crisis in 2007 and after the crisis in 2014. One data emerges, for example, that Italy, Spain and Portugal are now together. It means that their cohesion is driven by a very bad performance especially in the labour market. Even inside this common framework what becomes apparent is the fact that something is changing and something

Deliverable 6.6





that has not improved the social cohesion across countries and this point seems not to be addressed by policies along the course of the last years. This aspect is considered very important because from the example examined common indicators can be derived but from a different point of view.

4. Session 1: main project results

4.1. New challenges for official statistics and indicators for policy makers - (M. P. Sorvillo, Istat, Italy)

The main objective of the presentation given by Maria Pia Sorvillo is to describe some of the results achieved in work package 5. Activities under this work package are ongoing but, as already mentioned by Fabio Bacchini in his presentation, in 2018 a first important output was delivered, that is the Reflection Paper (deliverable 5.1¹). This very rich document describes the challenges that official statistics is facing that can be grouped in three main issues: contextual; data and methodology; dissemination. With respect to the context, official statistics has to face the presence of other data producers and the complexity of modern societies and multidimensional phenomena. On data and methodology, the main issues are new sources, integration methodologies, experimental statistics and quality standards. Moreover, evidence-based policy making is calling for relevant data, innovative frameworks of analysis and extended macroeconomic and microeconomic models. Finally, about dissemination, it is important to promote a statistical culture and to support citizens and policy makers to use data in a more effective way.

Then she moved to the other main task of work package 5 that is to develop a pilot study to draw some conclusions and main insights on how SDGs and well-being indicators are used for policy making. As it was shown in the deliverables of work package 1, many countries have developed a system of SDGs and well-being indicators but they are not always used by policy makers. The main challenges is how to use these indicators in a more effective way.

As she explained, the work started by selecting two countries among the consortium partners: Hungary and Italy. Hungary has a centralised system where policy making is made at the central level. Great attention is given to sustainability, including socio-economic issues but at the moment there is no public policy strategy focused on well-being. Italy has a central system where many tasks are decentralised at local level (policy making at Region and Municipality level) thus, there is an effective distribution of political power. Well-being has been very much studied to develop indicators and there is a well-established linkage between policy making and these measures of well-being at a national level.

She showed in detail the two countries. With respect to Hungary, in 2007 the first strategy on sustainable development was set up as a pragmatic integration tool, which summarized all the social matters and challenges. The goals and targets of this strategy were defined at the national level,

¹ the deliverable is available on the website of MAKSWELL project in the output section at <u>www.makswell.eu</u>





thus a strategic planning of sustainable development at a regional and local level was missing. In 2008 the Hungarian Parliament established the National Council for Sustainable Development (NCSD) as an independent national institution. This represented the conceptual shift from a development-centric policy towards a sustainability-centric, resource management strategy. Another important step was the enactment of the *Fundamental Law of Hungary* that came into force in 2012. This Law contains clear articulation of three main principles: rights of future generations; preservation and protection of the material, intellectual, and natural resources; mainstreaming of the concept of sustainability into public policies. The principal body for the protection of the Fundamental Law is the Constitutional Court that has the right to annul laws and decrees that are in contradiction with the principles of sustainable development.

Concerning the NCSD, it has conciliatory, consultative, and advisory tasks and includes as president the speaker of the Parliament, and as members representatives of political parties, the scientific community, economic interest groups, civil and religious organizations. Every two years, NCSD publishes the Monitoring Report on the implementation of the national strategy based on 16 key indicators and 87 context indicators.

After the adoption of the 2030 Agenda. The country made a review of its strategy. Even if it was decided not to change the national framework to achieve the UN goals, in the near future, a merge is possible between HCSO (Hungarian Central Statistical Office) publications, the National Framework Strategy on Sustainable Development and the SDGs. The NCSD started activities aimed at raising awareness and social engagement about the implementation of the international Sustainable Development Goals (SDG). Concerning the role of the Hungarian Central Statistical Office, it participates in the work of the NCSD as a permanent invited guest, collects data, elaborate and publishes several indicators. In particular, 103 indicators (16 key indicators) are elaborated to draw a full picture of the status of human, social, environmental and economic resources. These indicators are included in the progress report prepared by the NCSD on the implementation of the framework strategy. The Central Statistical Office has created also an interactive website, where information on key global indicators can be found as well as information on all SDGs. In 2013, the Central Statistical Office made an indicator system to measure the well-being of the population. It includes eight-dimensions, objective and subjective. Currently publishes data about the subjective well-being and about the different dimensions of the indicator system. Data are available, also at regional level, but until now, no public policy strategy focuses on well-being.

Moving to Italy, in 2015 with the adoption of the Agenda 2030, the new global vision was applied to the national strategy, previously limited to targets and actions for environment, including now different areas of social and economic development. While goals and targets are set at the national level, sustainable development is going to be introduced in a structural way also in regional strategic planning. In 2018, the National Commission for Sustainable Development was set up with the task to report and monitor progress, define national quantitative targets, develop models to evaluate policy on a sub-set of indicators.





Within this context, the role of the Italian Statistical Office (Istat) is that to support these strategies with the data production. Since December 2016, Istat manages and updates the National Statistical Platform on SGDs indicators. Every year, publishes a Monitoring Report and the last edition included 303 indicators: 96 international (real SGGs indicators), 117 proxy, 90 context indicators. The data made available provide a breakdown by gender, citizenship, limitations (disability) and territorial level (regions, large cities/urban/rural).

Concerning the well-being measurement, in 2010 Istat, together with representatives of the third sector and civil society, developed a multidimensional approach to measure "equitable and sustainable well-being" (Bes), in order to complement the indicators related to production and economic activity with measures of the key dimensions of well-being, together with measures of inequality and sustainability. The framework that was set up to measure well-being is composed by 12 dimensions and since 2013 a report on equitable and sustainable well-being (Bes) is published every year. The report contains a detailed analysis of well-being that goes down to the NUTS2 level, providing a description of well-being in the 20 Italian regions, and the updated set of 130 indicators.

In 2016, the "Equitable and sustainable well-being" became part of the national economic planning: the Economic and Financial Document (Def) has to include an analysis of recent trends for selected indicators and an impact assessment of proposed policies. The indicators for which the impact of policies is being measured is a subset of 12 Bes indicators: among which the mean adjusted disposable income (per capita); the disposable income inequality and people living in absolute poverty.

To give an idea of what happens at a political level, Maria Pia showed a figure that describes the path of the *non-participation rate in labour market* in 2016. Compared with the black line that describes the trend of this indicator without any policy the other lines describe the paths with different policy measures. This are ex ante evaluations and there is not an ex post evaluation.

The majority of Italian regions refer to Bes indicators in their Document for economic planning (DEFR). As Maria Pia pointed out in her slides there are many open issues such as the lack of homogeneity in the planning documents and the lack of comparability. Particularly important are also the difficulties in linking missions/objectives to Bes domains/indicators, data gap and ex-post policy evaluation. Very interesting is the figure she presented that shows the difficulties in linking policy to well-being. It shows that not all the policies and actions that are important for the Bes from an objective point of view (horizontal axis) have been considered equally important by decision makers (orange circle in the figure). This indicates a cultural gap that would be important to fill.

Concerning Municipalities, a study is underway to categorize the Bes indicators according to the public accounting classification (see slide 18). This should allow to logically connecting the local needs, the local policies resources and the policy results. It reveals what is important to support the decision-makers in a proper use of Bes indicators in the strategic-planning and policy-monitoring. The slide shows the results of the first classification, made on a single municipality. Experimentation





is ongoing on a sample of municipalities to reach a shared framework. Comparing policy areas of local governments and Bes indicators, the weakest ones are Economic development and Competitiveness, Public order and security and Health care. Data gaps are the main obstacle. Most but not all Bes indicators are available at regional level. Some relevant data gaps are found in the Environment domain (e.g. CO2 and other greenhouse gas emissions) and in the Economic well-being domain (Per capita net wealth, People living in financially vulnerable households, People living in absolute poverty).

Possible Solutions can be the use of non-traditional data sources, also to define new indicators (see deliverable 2.1 mobile phone data to measure poverty or satellite data to monitor land use, ratio of urbanization), Big data (see deliverable 2.2 regional price estimates), model-based estimation methods (see deliverable 3.1² on small area estimation for economic well-being indicators).

At the end of her presentation, Maria Pia drew some conclusions concerning the results from the pilot study that reveals that the two countries are focusing on different aspects, but they share high attention to the topic of sustainability and well-being. Then, she said that Improvements are needed from the technical point of view to reinforce models, data availability and data quality. This issue is even more relevant for regional and sub-regional indicators. Although the attention on well being and sustainability issues os growing, improvements are needed and the lower is the geographical dimension the worse are the data.

The biggest challenge is to ensure an effective link between measurements and policy actions. Policy makers should take into account these measures in all the steps of policy cycle that includes the evaluation and monitoring phases as well. Finally, more time and efforts are needed to fully integrate this new topic in the political agenda and to involve the public opinion.

4.2. Insights on statistical methodologies and new data sources for SDG and well-being indicators - (J. van den Brakel, CBS, The Netherland)

The presentation given by Jan van den Brakel, leader of work package 2, focused on the main results and methodological insights obtained from the research activities in this work package but also from the work packages 3 and 4.

At first, he presented the partners of MAKSWELL consortium involved in this activity that are three Universities (Southampton, Pisa and Trier) and three National Statistical Institutes (Italy, Germany and the Netherlands). Then, he described the main objectives of the work package that are to provide an overview of traditional and non-traditional data sources for SDG indicators together with methodological developments using new data sources (big data) in this context. To investigate integration of traditional and non-traditional data sources (small area estimation, nowcasting) and

² the deliverables are available on the website of MAKSWELL project in the output section at <u>www.makswell.eu</u>





pointing out quality aspects of big data (representativity, timeliness, [...]). Finally, to provide a review of good and bad practices and identify needs for future research.

Going into details of the deliverables, Jan van den Brakel described the main topics covered by the deliverables 2.1, 2.2³ and the ongoing deliverable 2.3.

With respect to deliverable 2.1, named "Aspects of existing databases, traditional and non-traditional data sources and collection of good practices", it contains an overview of traditional and non-traditional data sources for SDG indicators, through an inventory of the current situation in Italy, the Netherlands and Germany. Then it includes a review of good and bad practices in data collection and it is a very extensive report of experimental statistics. He mentioned google trends to measure propensity to move (CBDS), the use of scanner data in Italy to improve the CPI; the use of mobile phone network data (day time population, mobility, tourism, migration flows, poverty, economic growth); the use of web scraping from websites (estimating number of innovative companies, prices), social media studies (classifying messages to measure social tension and sentiment, including a now-cast exercise with the consumer confidence index) and found data (for example estimating unmetered photovoltaic power using time series of electricity). Finally, he mentioned the use of remote sensing data such as Copernicus project on land use in Germany, the measurement of urban sprawl using satellite data (CBDS) and the detection of photovoltaic solar panels in aerial images.

Moving to deliverable 2.2, named "Methodological aspects of measuring SDG indicators with traditional and non-traditional data sources", it describes methods to combine probability data with non-traditional data sources, for example in the form of small area estimation and when statistics are produced frequently over time with the use of time series methods. For example in the form of now-casting to produce more timely regional information. Methods are investigated to use non-traditional data sources as the primary data source to produce official statistics and how you can correct for selection bias in this type of data sources. Moreover, the analysis deals with the possible use of an input-state-output framework as an alternative for juxtapose a large set of indicators.

The last deliverable 2.3 is based on the results from the previous deliverables of WP2 and the deliverables 3.1, 4.1 and 4.3⁴. It identifies several areas where there is need for further research. The first area is to produce a more established **quality framework**. We know that a very established quality framework applies to probability samples but such an extended framework is not available for non-probability data, non-traditional data, big data etc. This framework should be extended to these situations and he stressed that we should move from a total survey error framework to a total error framework.

Another important need is that for **additional methodology** to identify two ways of using non-traditional data sources in the context of official statistics. The first concerns the use of this data

³ the deliverables are available on the website of MAKSWELL project in the output section at <u>www.makswell.eu</u>

⁴ the deliverables are available on the website of MAKSWELL project in the output section at <u>www.makswell.eu</u>





source directly as primary data source to construct statistical information; the second to integrate them with survey data by using them as covariates in model based inference procedures like small area estimates, time series models and now-casting. In the first approach, using them as primary data sources, the main issue is how you can correct for selection bias, as the data generating process of this data is unknown. There is a lot of new literature coming into this context on how you can correct for selection bias by using non-probability data sources but all these methods require structured data in a way that you can identify the units of your intended target population in the big data source. That is an issue because big data source are often fuzzy and unstructured and this method also need strong auxiliary information to correct for possible selection bias and it is generally not the case with big data sources. Thus, we need new methods that handle these issues and new methods to obtain better insight into the performance of the existing correction methods if auxiliary information is obscured with errors.

When you combine this data source with probability samples by covariates in model based inference procedures, there is need for more evidence to illustrate the efficiency of SAE methods compared to machine learning algorithms. Small area estimation is a well established approach to make inferences for small regions particularly in the context of the poverty estimation in developing countries. There is another approach where machine learning algorithms and artificial intelligence algorithms are applied to remote sensed data to make estimates for poverty and income. These approaches typically use a dataset to train a machine learning algorithm on satellite images or the path of remote sensing data and then in the next step they apply this algorithm to this remote sensing data source only to make predictions for poverty. It is identified that formal small area estimate are more efficient then model that apply only machine learning algorithms. It would be also good to convince national statistical institutes to move towards the usefulness of model-based inference methods in the production systems.

Concerning time series models, the analysis done in deliverable 4.1 has developed a dynamic state space model to combine a large set of potential auxiliary series with series that come from the surveys. If you look at potential auxiliary series based on big data sources, for example Google trend, and just combine them in a high-dimensional multivariate time series model you can develop a dynamic factor state-space model. In the Netherlands, it was applied for now casting the monthly unemployment. The method is nice but looking at the information is quite disappointing and it highlights that we need a selection criteria that allows selecting the relevant auxiliary series from the huge amount of potential series without falling into the trap of data dredging. Another issue that we faced is that most of the standard methods assume that correlations between your target series and auxiliary series is time invariant. That is a strong assumption as you are developing this type of state space models that allow for time-varying state relations. Thus, this is an area for further research.





Another issue is the **low risk appetite of national statistical institutes**. For good reasons they fill comfortable with low risk and commonly use probability sampling in combination with design-based inference models. If they want to use these data sources, they have to embrace model-based inference methods either to correct for selectivity or as covariates in SAE and now-casting procedures. They have to move from the familiar designed based methods to the model based inference methods. More empirical research is needed to illustrate the benefits of such methods in the context of official statistics.

Another issue is **remote sensing data**. They are used successfully in absence of high quality official data. In Europe where you can access to good high quality official data they can be used to improve regional detail or accuracy. The integration of remotely sensed data in the framework of SDGs and well-being measurement is predominantly experimental. The statistical purpose is predictions for well-being and SDGs such as spatial comparisons, temporal comparisons. However, this requires combining multiple images, comparing images of the same area over time and the issues can be spatial image inconsistency, temporal image inconsistency and computational power and data storage capacity.

On the research side, methods should be developed that reduce spatial and temporal image inconsistency, that support a better understanding how these error sources influence/increase uncertainty of predictions for poverty, well-being and SDGs. New methods should account for or reduce the influence of these error sources and should quantify the increase of uncertainty on predictions for well-being, poverty and SDGs due to these error sources. Finally, research should develop methods to validate the reliability of constructs for poverty and well-being derived from remote sensed data.

Concerning data and hardware issues, the processing of images for large areas and longer periods require considerable computational power and data storage capacity. The availability of the required AI hardware and AI knowledge is not standard available at national statistical institutes. Another issue is that satellite images of sufficient quality or resolution are only commercially available. We can conclude that to facilitate a wider development of satellite-based applications a Europe wide computing infrastructure should be established that could make this type of methodology development independent from commercial institutes that sell this high quality satellite images.

4.3. Using Alternative Spatial Data Sources for Small Area Estimation – (N. Tzavidis, University of Southampton, United Kingdom)

Nikos Tzavidis gave his presentation online as the sanitary emergency restrictions imposed by his Organisation for the Covid-19 outbreak, prevented him to attend in person in the workshop. Thanks to the IT facilities and the great support provided by the staff of the Blanquerna University, it was





possible to ensure a remote presentation that could also be followed on the live streaming of the workshop.

As Nikos said, the presentation intends to summarise some important research results that came from the activities in work package three and will be described in detail in the forthcoming deliverable 3.2⁵. The content is very specific, focusing on the use of remote sensed data as auxiliary variable in small area estimation. He describes the results of an application made on a developing country but the conclusions and main insights can be extended to other country with important suggestions for statistic production.

First, he presented a general slide that highlights some issues related to small area estimation. The main use of this models refer to the estimation of social and demographic indicators at sub-national levels. Estimates are often built using survey data. Sample sizes are often insufficient for obtaining reliable estimates for small areas under the typical survey inference framework. There is need to improve the precision and it is growing the use of auxiliary data sources and statistical models to borrow strength across areas. This is a very active area of research⁶ as it was also pointed out by Jan in his presentation.

He mentioned same alternative data sources such as remotely sensed (RS) data, mobile phone (CDR) data, web-scrapped data, social media data etc. that can be used as covariates or response in small area estimates besides census data and administrative data. In this regard, he suggested looking at the article by Marchetti et al. (2015)⁷. With regard to a discussion of some methodological issues of the use of alternative data sources in the context of SDG monitoring, he suggested the articles by van den Brakel, Buelens, et al. (2019)⁸ and van den Brakel, Smith, et al. (2019)⁹, both included in the deliverables of work package 2 of MAKSWELL project.

Then he went into detail about the use of remote sensed data and the possible use of these data covariates for small area estimation. As he said, this data is broadly available and frequently updated and low cost. This data is particularly useful in low-income countries where high quality survey, census and administrative data may be scarce. Remote sensed data allows a flexible definition of target geography, as there are no predefined geographical areas. This source of data can be a potential for European countries and the main issue is how the use of this data can be translated into the production of official statistics. However, remote sensed data has also some limitations. The first concerns the explanatory power and the link between auxiliary information and outcome that can be unclear. Then, there is the potential for irregular coverage and the need for substantial pre-processing, as mentioned also by Jan in his presentation. However, assuming that the quality is

⁵ the deliverable is available on the website of MAKSWELL project in the output section at <u>www.makswell.eu</u> ⁶ See Pfeermann (2013)

⁷ Marchetti, Stefano et al. (2015), "Small area model-based estimators using big data sources". In: Journal of Official Statistics 31.2, pp. 263{281}.

⁸ Van den Brakel, J.A., B. Buelens, et al. (2019). Aspects of existing databases, traditional and non-traditional data sources and collection of good practices. Work Package 2, deliverable 2.1. MAKSWELL Project.

⁹ Van den Brakel, J.A., P.A. Smith, et al. (2019). Methodological aspects of using Big data. Work Package 2, deliverable 2.2. MAKSWELL Project.





good they can be used as covariates in our models but an adequate use requires some degree of specialized knowledge, that is specific skills in terms of processing the data.

The presentation moved to describe some modelling approaches comparing the statistical approach versus the algorithmic/mapping approaches.

Concerning the Statistical modelling (SAE), the main features are that real observations of the phenomenon are required (survey); the sampling design is taken into account; methods of model assessment (GOF) and area-specific uncertainty of estimates (MSE) are implemented; area-level models such as Fay-Herriot (Frequentist/HB) that can include spatial/temporal effects are used. They may have relatively coarse geography.

On the other hand, the algorithmic/mapping approaches have the following characteristics. Generally, no consideration of sampling design. These approaches use survey data but ignore completely the sampling design. A lot of this methods are black box using GLMM's, classification trees, support vector machines. The aim is to produce estimates at very granular geographies, proposing smooth map of the outcome of interest. However, all this can be a very risky strategy for official statistics. Many statistical offices in developing countries use this approaches due to the lack of census data or administrative data. Thus, a lot of work is done using algorithmic methods.

After this theoretical introduction, he presented the results from a real application in a developing country where both approaches were used to perform a small area estimate when there is only remote sensing data and no information is available from census or administrative data. It refers to a poverty measurement application in Bangladesh in the spirit of Steele et al. (2017)¹⁰. The target is the wealth index and the data available is survey data and remote sensed data, there is no information about census data or administrative data. It is used a Fay-Herriot model.

The aims of this exercise are to identify common points and differences between both approaches, to illustrate the use of standard packages for each approach (sae, BRugs, R-INLA) for fitting of small area models and to identify potential methodological issues. The remote sensing data are three variables that are used as auxiliary.

He shows the results of the estimates from four models: 1) Standard FH model using SAEand with sampling variance and design known; 2) Standard Gaussian model in R-INLA; 3) R-INLA with fixed parameters; 4) HB using BRugs¹¹.

Model 1 is the classical FH model that takes into account the sampling design. Model 4 uses a hierarchical framework in a classical small area framework and sampling variances are known. Thus, both models use the frameworks that you have in a classical small area framework. Model 2 is normally used when you ignore the sampling design and the model is not identified. It uses algorithmic tool. The presenter suggests that it is a problematic model and thus, model 3 is our attempt to try to correct model 2.

¹⁰ Steele, Jessica E et al. (2017). \Mapping poverty using mobile phone and satellite data". In: Journal of The Royal Society Interface 14.127.

¹¹ Details of this analysis can be found in the presentation slides available on MAKSWELL project website.





Looking at the sensitivity analysis results, there are small differences in the fixed effects (regression parameters) but there are large differences in the variance decomposition. About model 1 and 4, estimates are very close. Model 2 shows different values for the variance decomposition. This means that there are problems. Model 3 seems to correct these problems.

Then, he described the plots of point and uncertainty estimates. While the plots of point estimates show low impact, a large impact results in the second row that shows uncertainty measures. Estimates of uncertainty are very different among these models. Thus, the results show that using only an algorithmic analysis that ignores the survey data and the sampling design (model 2) you can produce estimates that are not correct.

He ended his presentation with some concluding remarks. It is possible to use remote sensing data in a supervised learning environment using them as covariates into a model that uses survey data and remote sensing data to produce small area estimates in absence of other information such as census data and administrative data. But you have to be very careful. Ready to use software offer great possibility but they need specific knowledge to be used correctly. Then, important method issues need to be addressed.

The main message is that we can bring remote sensed data in official statistics but when we do that we have to be careful, software seem easy but you need specific knowledge and accounting for sampling design is very important. The use of algorithmic tools to produce estimates needs methodological improvements. This is an import point and the entire statistical community should be aware of these risks¹².

4.4. (Monetary) Poverty lines and local price levels – (S. Marchetti, University of Pisa/Camilo Dagum Centre, Italy)

Due to the Covid-19 outbreak which had, among other effects, that of limiting movements from one country to another, the presentation of Stefano Marchetti was given through remote connection via Skype, web platform which had, among its characteristics, that of sharing the screen. The support of the IT staff and all the tech devices which the venue was very well-equipped of revealed to be essential. Words of thankfulness were addressed for this.

Starting his presentation, Stefano Marchetti introduced quickly the team that is involved in this research activity for MAKSWELL. In particular, all the members are professors and researchers of the Universities of Pisa, Siena and Florence and also from other Universities which currently form the Tuscan Interuniversity Research Centre on Advanced Statistics for the Equitable and Sustainable Development (ASESD) 'Camilo Dagum'. The study that he is going to present stems from this very fruitful scientific cooperation.

Moving at the presentation, he started by mentioning the worldwide recognized importance of estimating poverty indicators at sub-national level. Poverty is a multidimensional concept and in this work the focus is on relative monetary poverty indicators. The results highlight that many

¹² This analysis and the its main results will be part of the forthcoming deliverable 3.2 of MAKSWELL project.





factors may impact on the value of the sub-national poverty indicators. These are: the choice between income or consumption data, the use of national or local poverty lines, the local cost of living and the use of small area estimation techniques.

The aim of the study is to estimate the Italian households' Head Count Ratio (HCR) or At-Risk-of-Poverty-Rate (ARPR) using consumption expenditures from Italian Household Budget Survey and disaggregating these measures for the 20 regions (NUTS-2 level) and the 110 provinces (NUTS-3 level) in Italy. Three are the issues addressed: the use of national or local Poverty Lines (PLs) to estimate the incidence of poverty in Italy; the computation of Purchasing Power Parities (PPPs) that take into account differences in prices at a local levels and the use of Small Area Estimation techniques to estimate the ARPR and the PPPs for the Italian provinces.

The study highlights the impact of the use of sub-national poverty lines in measuring the poverty incidence. In other words, the use of different PLs has strong geographical implications in the evaluation of Italian households' poverty. Analysis goes deeper at the provincial level and a small area model is used to obtain more accurate estimates. The model is based on a specification at area level, the so called area-level Fay-Herriot model which uses as auxiliary variables the per-capita taxable income and the share of households that are owners of their house. Results suggest that the measures of monetary poverty incidence at provincial level change if we use national or local (regional or provincial) Poverty Lines.

Analysis shows that the risk of poverty rates are based on poverty lines and the cost of living should correct the risk of poverty. Thus, analysis measures household poverty incidence at provincial level using consumption data adjusted with regional PPPs.

Within this framework of analysis, Stefano Marchetti gave his concluding remarks pointing out that the choice of the PL is very relevant when the aim is to compare local relative poverty indicators; moreover, the national poverty line can be adjusted to take into account different level of purchasing power within the country. It should also noticed that preliminary results show differences in the levels of prices for rent house and for food expenditure, due to some limitations deriving from scanner data goods coverage.

Steps to do in the future within the last phase of MAKSWELL project and its legacy are: refining CDP models, putting into action the idea to use quantile regression on the whole set of prices, avoiding to many averages; refining hedonic regressions; computing adjusted national poverty lines and estimate local HCRs, using small area estimated methods.





5. Session 2: on-going EU-wide research activities related to MAKSWELL project themes

5.1. How to translate cultural and language-related factors into social indicators to measure discriminations and its effects on inequalities (V. Bello, Blanquerna-Ramón Llull University, Spain)

She started to say that it was her primary intention to clarify the contribution she would present within MAKSWELL project. As far as she could admit, actually was more the contribution the project is providing to her rather than what she could provide to the audience, in a certain way.

What can be useful for the project is to consider alternative ways to use social indicators particularly for her specialization in no material factors and how they affect some social phenomena, in particular normally focussed on prejudice.

This has been connected to the work she has done in the past as representative for the United Nations University in an Agency of the UN for the Sustainable Development Goal nr 10 "Social Inequalities", during which she analyzed in particular social inequalities and the effects the prejudices have on inequalities.

Prejudice is an important component of inequalities because, when the social reality is framed through the lenses of prejudice, as learnt from past sociologists like Dubois, who has particularly focussed on races. Anyway the same happens with prejudice, because when you frame the entire reality through the veil of prejudice, then it's very often the case that the inequalities would increase in those places, particularly prejudices widespread at a country level.

She went on explaining that she has always focussed on those non material aspects. For this reason the presentation given is divided into two main parts:

1) in the first part there is the explanation on how she has incorporated some non material elements, in particular, the construction of collective identities into the measurement of prejudice in a particular way, i.e by using some social indicators that existed in the literature as well as in the European asset;

2) how she is now thinking in a similar way to do a similar operation with the topic of securitisation of migration and narratives towards migrants, thus measuring the effects of narratives this time on prejudice.

In this way it is explained the title of the first slide "How to translate cultural and language related factors into social indicators to measure prejudice and its effects on inequalities".

As far as identities and social indicators are concerned, she passed to describe her first research studies in that sense, calling back through an excursus her former researches starting with the activity carried on in Trento University, Department of Social research methods, in collaboration with the statistical Institute in Trento, where she was used to have a variety of research methods, from qualitative to statistical ones. She was also been trained at using mixed methods, on how to put together qualitative and quantitative research. She never had a prevalence of one method over





another, the tendency was to evaluate each research useful and each that contributed to the wellbeing of the societies.

In 2009, thanks to the Marie-Curie funded Research Programme, she arrived in Barcelona. At that time she was studying the effects of collective identities and the construction of collective identities on the formation of prejudice but more qualitatively. When she joined the United Nations University in 2012 she had experienced the process of going through from the Millennium to the Sustainable Development Goals. As she was working particularly on inequalities the UN wanted more measurable data that could be more generalised to a greater extent with respect to her research work based during the Marie-Curie on qualitative methods.

She went back to the quantitative method and the idea then came that through an important theorisation which combined Weber's ideas with Blumer's ideas she wanted to go more in depth into the theoretical reason (cfr. issue nr 52/2016 of the Journal of Social Indicators Research) so she could consider that collective identities have a specific process of construction that leads towards inclusiveness or towards exclusiveness, in other words towards open collective identities (inclusiveness) or closed collective identities (exclusiveness). She then thought to create an index based on a combination of social factors that could somehow translate that theoretical formulation into a construct. But still something more was needed. She then decided to use some of the social indicators present in the MIPEX index on the integration policies in Europe, in particular the "Access to the labour Market" in different countries, the "Access to citizenships rights", the "Access to political representations". At this step she needed to complete the theoretical framework she had in the construct; she had to combine it also with some aggregated data detected from European Social Survey round 4 and 5, particularly on sociability and trust at country level. She then put all this research result in an index that was very fight through the principle component factor analysis and used in a multilevel analysis to explain prejudice. The index derived from this study was called COI Index (Construction of Open Identity) and it was used as a context level variable with a multilevel analysis to explain attitudes towards prejudice. It proved to be a very good method, statistically very sound and solid. It represents one of the few attempts, in her opinion, to translate what are non material factors into social indicators. It is quite innovative research and it can be considered pioneering, something to be very proud of.

As regards her further ambitions, she went on stating that after 2015 she came back again to the qualitative research to understand in depth the complexity of the formation of prejudice. In the literature there are two important ways to consider some of the factors that affect prejudice and one of these is the threat, i.e. the fact that migrants can be considered under certain perspective a challenge for the society due to culture, social and security or economic reasons. There are two main perspectives: 1) the realist threat perception according to which the migrant is viewed as a competitor in the labour market, for social services; 2) the perceived threat perception, already translated into statistical analysis. It comes from Blumer's idea that during specific moment of crisis in countries some unscrupulous leaders would "escape code" migrants for problems that are already there in the society.





One of the most well-known study on how to measure the prejudice comes from L. Quillian but it is also criticized for the very important intervention he does on the theoretical framework that Blumer has, by reducing so much the complexity. It is not a different thing because the discourse is always about sociology; it's not a different field, one of the securitisation of migration security studies, as she works interdisciplinary between sociology and international relations. In the security study there is this important new branch that is the securitisation of migration. They have a similar idea with respect to the one Blumer had: migrants are socially constructed as threat. Of course, they could be realist threat for other reasons but they are also socially constructed as threats. The question is: how it can be measured because that has been done in international politics only. The answer could be: solely through qualitative research. According to her background this method could be good but there was also the need to explain at a broader level what happens. She stated that she was unsatisfied only with the understanding why specific persons, because of a combination of different situations, start to perceive prejudice as threat. Also in the literature on the securitisation of the migration there are several interpretations on how this process works with securitizing speech acts from Austin and that idea to the securitizing and counter securitizing narratives. In this way the role of both those actors that produce those narratives has to be taken into account, on one side a complexity of actors such as media, mainstream media, social media, political leaders and the government itself, civil society, NGOs, while on the other the audience. It is important to analyze how the audience perceives, because not everybody would take for granted the narratives that certain actors produce. The question is how to combine all this and how all this can be measured through a multilevel analyses access she had already done.

She then thought possible to create another index but in this case something like the MIPEX Index was needed that didn't exist already. Like the Migration Integration Policy Index that exists already in Europe as a dataset, in fact, there is no index on the narratives of securitisation. On this point she added that the fact of translating narratives into social indicators is a very pioneering and ambitious thing.

She went on saying that it was necessary, first of all, a qualitative research that could measure the production of these narratives by parts of different actors (mainstream media, the political leaders, the social media) on one hand and the counter narratives of the civil society on the other. The next important thing was to understand the role of the audience into accepting this and then to construct social indicators that provide a score for the level of securitizing narratives in a country and how this affects the formation of prejudice. This is the most ambitious part of the project and its complexity, because up to collecting qualitatively the data on the narratives (that is already challenging by itself because it's a big qualitative analysis), this can be done. We can score it somehow to have them into some social indicators but how to consider the impact that they have according to the different audiences should be taken into account. On this respect she herself declared that she hasn't still found an exact idea on how to translate that impact on the social indicators and the index for them using these indexes at context level variable, as done in other multilevel analyses and multilevel studies that she has carried in the past. She added that she is sticked at that point and she has





to the MAKSWELL project and see what are the current possibility of measuring language based factors, that is to say non material factors such as integration as well as the identity, with the intention to consider the facts on prejudice and therefore to use them on inequality to consider the impact of prejudice on inequality. The fact is, in her opinion, that at a national statistical level, the non material indicators of the narratives cannot be used, nor the identity, to consider inequalities. But actually the aggregated data on prejudice do exist, so once we can explain the effect of securitisation on prejudice we understand better prejudice, not only the realistic part that is in prejudice but also the perceived (social) construction that is behind prejudice; and then what can be done at a national level could be standardized easily, particularly considering that there is a European Social Survey already providing measures for prejudice. That, for example, could be included into national statistics to see what is the aggregated level of prejudice in a country and its impact on inequalities. She concluded leaving this big question mark open and thanking the project's partners contributions of the speakers present there and also in remote connection, underlining that she has taken several notes from what has been presented, judged very interestingly connected with some of the intentions of the project proposal she was going to submit to the European Commission in the next Horizon 2020 call, in particular the fact that there is an hint at alternative ways and alternative data to consider these phenomena, particularly related to the Sustainable Development Goals and many other elements from the different presentations proposed in the very informative workshop organised.

5.2. Atlas of Household income distribution (ADRH) (A. Argüeso, National Institute of Statistics, INE, Spain)

The invited speaker Mr Antonio Argüeso from the National Institute of Statistics of Spain (INE) stated as first thing the fact that his presentation would be about something very practical, i.e. experience gained at INE on how to combine administrative data and mainly TAX data to produce a more detailed geographical information about poverty.

As regards poverty or living conditions it is common practice for the statistical office to provide to the society the results coming from the EU-SILC survey. This is the survey used in Europe. Actually this Spanish survey is big in terms of sample size. It started in 2004 in Spain and it provides information at national and NUTS-2 level. The sample size is around 13,000 households and roughly 27,000 people. It was stressed the fact that problems start to arise when it is put in use this kind of sources to provide data not a the national level or at big region level. Taking for example Catalonia, which is one of the biggest regions in Spain, the graph presented shows a lack of stability of series as regards "at risk of poverty rate", thus difficult to understand. The problem is mainly sampling error that is not always easy to translate to the society, stated that it deals with something else. It appears clear reading the newspapers when they try to interpret this increase or decrease in the poverty rate. This difficulty has mainly to do with the size of the sampling. To this point he added that in Spain as well as in all Europe they are trying to solve this problem and to increase the size of samples.





He explained that INE is in the process to increase the sample size in EU-SILC survey, according to the current plan, in line with the IESS EU regulation, in order to roughly double the expected size for 2022, reaching 25,000 households that means more or less 60,000. But this is not considered enough, even if providing data at regional level. With this respect the question to ask is on what is known about poverty and inequalities at detailed geographical level. If we want to know the number of people at risk of poverty in Barcelona according to the information in possess from the survey, it was showed, through a map of the country of Spain with its seventeen regions, that Catalonia is a region which is in better conditions than others. The typical image of Spain actually is that the South is poorer and the North is richer (similar as in Italy).

At this point he came to describe a different approach consisting in a project implemented by INE jointly with the TAX collection Agencies, one main agency covering the 93% of the territory and 4 covering the Basque regions. The situation is quite easy to explain because they have good information on taxes but related to people, not to households. It is not easy for them to put together the information into households and even more difficult to have these households in the territory. In order to overcame such difficulty, the idea of the project came, based on the combination of the work of INE, which as NSI detects the population register. Moreover, it has people in households and households in the territory, and tax data and many databases given by the TAX Agency. Thus following this procedure, it was possible to combine the information deduced from all the 15 databases: Personal Income Annual declarations, Wages and salaries; Dividends; Rents derived from property ownership; Profit sharing from businesses; Aids; Social Benefits; Pensions [...] just to mention some of them. All the information coming from this source was combined with the "Population register" data and published at the lowest administrative level. The combination gave as result information not only on the average income per capita or per household, but also on distribution, i.e. how many people live under poverty lines or relative/absolute poverty lines.

Anyway, he stated that caution is necessary handling such data because TAX data are not exactly the same as survey data. In fact, comparing the functions of TAX data and survey data, the comparison provides a slightly different picture on income, mainly on the left-end of the distribution. Nevertheless, the data on poverty that can be drawn from these two sources is quite the same.

When using these data the main findings are as follows. It is a common practice to talk about differences among regions: for example, in the case of Spain the richest region is the Basque country or maybe in these days Madrid. With this respect, comparing the lowest income region, the average income is roughly doubled. But the big disparities can be noticed within the towns. In order to better explain this issue he passed to show the data for big cities published for the first time in 2014. He focussed the attention on Madrid, where it emerges clear what is the difference between the richest neighbourhoods and the poorest ones, i.e. 6,3 times higher, comparing big districts, while going deeper into a given district in the slide which followed, it can be noticed that the difference is even higher, also within a single district in Madrid the difference is higher.





Going further in his presentation, he said that at this stage the decision was eventually taken by INE to publish data at the maximum administrative detail, i.e. this census section that corresponds to 36,000 areas. The first thing in September 2019 was to open a new brand, which is widely used in Europe, but used for the first time at INE, called "Experimental". The first "experimental" statistics by INE Spain was the product he was presenting at MAKSWELL project: the "Atlas of Household per inhabitant for all census sections"¹³. At this point he passed to give a practical demonstration of this experimental statistics.

Considering the average income, focussing on the map of Spain which shows the combination between the population register and the TAX data, what emerges at first sight is something similar to what showed earlier, i.e. the North (in green color) is richer while the South (where red color predominates) is poorer. Zooming on the map and going in depth into it, taking in consideration this time the area of Barcelona, it can be noticed that it is not so green. It was specified that the screening was made according to census sections, not districts. A large part of Barcelona is green that means it is mostly rich but, zooming to enlarge the map, enormous differences can be seen between parts of town that are a block away, highlighting some data on average income which confirm the analysis. This means that the usage of administrative data provides a very different picture of the country, even taking into account some bias. Another thing that he deemed important to underline was that the average data is not the same as the distribution and inequalities data. He also put in evidence that the data given above showed the average data per census section. Passing to analyze another map that is closer to the concept of poverty in EU-SILC, here it appears clear that most of the country, above all in the centre, is colored in white. This is the part of territory called "empty Spain", deriving this definition from the fact that it is scarcely inhabited, so data cannot be collected from that area. Zooming again to enlarge the part where Barcelona is, it can be noticed that there are some districts colored on red that means they belong to the rich area of Barcelona. Zooming further the poor regions came out. It was precised that this analysis is in terms of inequality, i.e. people living below the poverty line (60% of the medium income). With this respect he gave the data corresponding to "Raval" area: in this particular census section of the centre of Barcelona the number of people living below the poverty line is 37,7 % while moving in another area close to this is less than 10%. In this way the enormous differences between very close areas appear clear. if the authorities at the local, regional and national level need the information on poverty to take the right measures, they need to have this kind of information. For example, in Andalusia the poverty line is more or less 30%, so knowing this data government could improve measures there in order to counteract that percentage.

At the end of his presentation to sum up, he closed saying that the product presented, although experimental so far, could be very useful, if adopted for a specific purpose.

Some questions/interventions from the floor followed.

¹³ <u>https://inespain.maps.arcgis.com/apps/MinimalGallery/index.html?appid=c8b41b2c471845afbc8f8eb20c54382e#</u>





• What poverty line was used in this experimental research, a local one?

He answered that the line of poverty used was not the local but the national one, but to be more specific not the one used for EU-SILC. It dealt with the poverty line used with this data handled in the "Atlas". It was added that information could be used also not only with relative poverty line but also with the absolute poverty line. To this respect he showed another map in which the absolute poverty line was used. On a closer look, anyway, the map revealed itself not so different. He then put the the focus on Madrid that, according to his words, reveals to be even more spectacular than Barcelona, as the differences appear to be higher. In fact, the richest regions in Spain in Madrid are side by side the poorest ones. The central part of Madrid has almost all over the green color, this meaning it is rich but not so far there is a rather extensive area in red that represents the poorest census section of the whole Spain (roughly the 60% of the population below the poverty line). This data is something new for official statistics: to find out how close the rich regions are to the poor area, according to the TAX data.

Have the population register and combining it with the TAX data it can be discovered that for roughly 98,5% of the households information in the TAX data can be found. There is only a very little percentage of households (quite 1%) not covered with any information from TAX data. To sum up, this information is not complete but it is quite near to be complete.

In Italy the situation is quite similar because there are available data also from EU-SILC Survey (20,000 households and 40,000 persons, more or less) and the problem is quite the same: how to join TAX data with surveys. There is also an experimental statistics where there is the attempt to put together a set of indicators for municipalities, i.e. to put together TAX data with some evidences on education, or some evidences on administrative data or the labour market. But the problem within such attempt is almost the same as the experimental product by INE has revealed: on one hand, how to support local municipalities to make their best to address the problems at their own territorial level. On the other, the research is trying to see if it is feasible to make some registers or even a register on income that could be related to the register of the population, because at the end it could be quite useful to have an integration of all these sources, otherwise there should be some problem on the interpretation of the results.

It was answered that in the case of Spain there is access to TAX data, also for EU-SILC. In this way it is possible to compare at individual level the declaration in the survey with the declaration regards the TAX agency. It must be stated that the differences are not enormous. But what is significant to highlight is that the richest people tend to declare less income in the survey, so they declare more income to the TAX Agencies. The contrary happens on the poor side of the distribution. Many people declare income to the survey but there is no correspondence with TAX data. Anyway the differences are not so great, in the sense that the picture that both survey data and TAX data provide are somehow the same.





- The intervention replying to this followed: in Italy there are some more differences because here there is the micro-linkage between TAX and survey data. But there is the attempt to see if it is feasible to have a comprehensive picture of the income starting, for example, to fix some data such as all the administrative data on wages. They should be the same both in the survey as well as in TAX data. The aim of this is to define some rules, a so called "Register for income". The fact is that some data are easy to improve such as, for example, wages but other are not this case but the effort is to work in view of a much more comprehensive register. it is esteemed that in one year the result could be reached in order to have a comparison between data. As far as today it is stated that the situation is quite similar to that depicted in Spain, with respect to the attempt to explore all the data that can be improved at the territorial dimension of the analysis conducted.
- Are TAX informations not used at all in the estimations procedure of EU-SILC produced by INE?

The reply was that EU-SILC is based on admin-data, on TAX data, on social security data. EU-SILC is, in fact, a combination between survey data, for the time being, and until 6 or 7 years ago it was a typical traditional survey, collecting data only from the survey. Since 3/4 years it has happened that INE received data from the TAX collection agencies and could make a comparison among data. Anyway, only data from the survey were published. At present the methodology has changed: EU-SILC is now a combination. For roughly 85% of people data are admin-data, TAX-data, but for some specific cases it deals with a combination of data, the data used are coming from survey. It is a mix model, combining administrative, i.e. social security and TAX Collection Agency data, and survey data.

• Could this data be read in an additive way, for example from municipalities? Is there a sort of coherence at the regional level? When using mix sources on TAX data and EU-SILC is the representativeness of the data at a regional level or census level coherent?

Yes, it is.

• What about the data on consumption? Is the survey on consumption connected to the EU-SILC on TAX data?

No, there is EU-SILC for income, and there is also the typical consumption survey. The question is explained because in Italy the consumption survey is used to provide poverty line but this is not the case in Spain, where only the income survey is used to produce the poverty line.





6. Conclusions

This third workshop of MAKSWELL project gave the opportunity to present the results achieved in the various research tasks by all the consortium partners involved. The main aim of the event was to provide also through the comparison with other on-going research experiences some insights on future needs for statistical methodology and on a more effective use of SDGs and well-being indicators for policy making.

About well-being and SDGs indicators, the research work of the project has made a sort of survey across European countries to see how the well- being and the SDG framework has been adopted by the NSIs and inside the public administration. All this with the objective to see if this framework meant to measure the Beyond-GDP system could also work for policy issues and if it could be improved by using new sources of data, for example big data, and by developing adequate statistical methodologies. It emerges that the well-being frameworks are not standardized across the European countries. They share basically a common approach that is almost the same as that proposed by OECD but there is need for some improvements in the standardization of the indictors. The most important point is that there is the need for a sort of metrics that tries to consider together all these indicators. Moreover, it emerges the importance of the use of well-being metrics in public policies. The challenge is to relate wellbeing and SDGs indicators to the policy cycle. Within this context the central message is that these new well-being indicators should be anchored in all phases of the «policy cycle», beyond the simple diagnostic. Well-being indicators should affect all stages of a policy process that proceeds from the agenda setting to policy formulation, then to the implementation, monitoring and finally to the evaluation stage.

The detailed analysis of the national and local strategies on well-being and sustainability in two countries, Hungary and Italy, with a focus on the role of the statistical offices in supporting these strategies with the data production, has revealed some points of strength and the need for further developments. Even if there is a national strategy for sustainable development, that defines goals and targets, there are not policy actions. Where well-being is part of the policy agenda it is included in the ex-ante evaluation but there is not an ex post evaluation. When sustainable development is introduced in regional strategic planning, it emerges the lack of homogeneity in the planning documents and the lack of comparability. Moreover, there are difficulties in linking missions/objectives to well-being domains/indicators and data gaps are the main obstacles. Thus even if there is high attention to the topic of sustainability and well-being, improvements are needed from the technical point of view to reinforce models, data availability and data quality. The biggest challenge is to ensure an effective link between measurements and policy actions.

Moving on to the results from the methodological research that was part of many tasks of the project, it emerged the need for a more established quality framework that should be extended to non-probability data and non-traditional data. It means to move from a total survey error framework to a total error framework. Additional methodology is needed to identify two ways of using non-traditional data sources in the context of official statistics. The first concerns the use of





this data source directly as primary data source to construct statistical information; the second to integrate them with survey data by using them as covariates in model based inference procedures like small area estimates, time series models and now-casting. Some main messages were pointed out such as the need to convince national statistical institutes to move towards the usefulness of model-based inference methods in the production systems and more empirical research is needed to illustrate the benefits of such methods in the context of official statistics. About the use of models that combine a large set of potential auxiliary series with series that come from the surveys it emerges the need for selection criteria that allows selecting the relevant auxiliary series from the huge amount of potential series without falling into the trap of data dredging.

Another important issue relates to the use of remote sensing data such as satellite images. They are used successfully in absence of high quality official data. In Europe where you can access to good high quality official data, they can be used to improve regional detail or accuracy. The integration of remotely sensed data in the framework of SDGs and well-being measurement is predominantly experimental. Two issues where analyzed in the presentations given in the workshop. The first concerns the need for methods that reduce spatial and temporal image inconsistency, that support a better understanding how these error sources influence/increase uncertainty of predictions for poverty, well-being and SDGs. The second concerns their use as covariates for small area estimation using a statistical modelling approach (SAE) or an algorithmic/mapping approach. Analysis has shown that the use of an algorithmic model that ignores the sample design may produce estimates that are not correct. It is possible to use remote sensing data in a supervised learning environment that use them as covariates into a model that produce small area estimates in absence of other information such as census data and administrative data. However, specific software knowledge is needed and accounting for sampling design is always very important. The use of algorithmic tools to produce estimates needs further methodological improvements.

Concerning the methodological development for measuring poverty, it is recognized the importance of estimating poverty indicators at sub-national level. The analysis performed highlights the impact of the use of sub-national poverty lines in measuring the poverty incidence. An empirical study demonstrates that the use of different PLs has strong geographical implications in the evaluation of Italian households' poverty. Analysis goes deeper at the provincial level and a small area model is used to obtain more accurate estimates and consumption data are adjusted with regional PPPs. It emerges that the risk of poverty rates are based on poverty lines and the cost of living should correct the risk of poverty.

With respect to the on-going research outside MAKSWELL but related to the project themes, very interesting is the research experience on how to translate cultural and language-related factors into social indicators to measure discriminations and its effects on inequalities. The focus is on how to translate what are non material factors into social indicators with the aim to measure prejudice. What are the current possibility of measuring language based factors, that is to say non material factors such as integration as well as the identity, with the intention to consider the effects on





prejudice and therefore to use them on inequality to consider the impact of prejudice on inequality. At a national statistical level, the non-material indicators of the narratives cannot be used, nor the identity, to consider inequalities. But these phenomena are particularly related to SGDs and well being indicators. Actually the aggregated data on prejudice do exist and it could be investigated what is the aggregated level of prejudice in a country and its impact on inequalities.

Completely different is the other research presented that reports a very interesting experience gained at National Institute of Statistics of Spain on how to combine administrative data and mainly TAX data to produce a more detailed geographical information about poverty. This research has led to the first "experimental" statistics by INE Spain that is the "Atlas of Household per inhabitant for all census sections". The analysis through an interactive platform allows having a detailed map of some income variables that reveals important differences in the income distribution. It emerges a very detailed geographical analysis of poverty distribution, i.e. how many people live under poverty lines or relative/absolute poverty lines. Caution is necessary handling such data because TAX data are not exactly the same as survey data. In fact, comparing the functions of TAX data and survey data, the comparison provides a slightly different picture on income, mainly on the left-end of the distribution. Nevertheless, the data on poverty that can be drawn from these two sources is quite the same. The product presented, although experimental so far, could be very useful, if adopted for specific purposes of policy making.

At the conclusion of the works Maria Grazia Calza, as MAKSWELL Project Manager together with Fabio Bacchini, as MAKSWELL scientific coordinator, addressed the Blanquerna-Ramon Llull University with words of kind thankfulness for its hospitality and for the possibility of connection on remote with the speakers scheduled in the agenda and, of course, for the live streaming.

All the present invited speakers were also thanked for their useful contributions and a special thank was also addressed to the MAKSWELL coordination team in the persons of Tamara Zangla and Maria Francesca D'Ambrogio for the collaboration in letting the event happen, although some difficulties already arising, due to the outbreak of the sanitary emergency of the Covid-19.





Annex 1

Presentations given in the 3° Workshop of MAKSWELL

The full presentations are available at <u>www.makswell.eu</u>

Session 1: main project results

Welcome and overview of MAKSWELL project

- Fabio Bacchini, Istat







New challenges for official statistics and indicator for policy makers

- Maria Pia Sorvillo, Istat



Insights on statistical methodologies and new data sources for SDG and well-being indicators

- Jan van den Brakel, CBS







An application of poverty estimation with remote sensing data

- Nikos Tzavidis, University of Southampton

Using Alternative Spatial Data Sources for Small Area Estimation
Nikos Tzavidis* Angela Luna Southampton Statistical Sciences Research Institute University of Southampton
MAKSWELL Project Meeting Barcelona, March 5 2020
*Presenting author

(Monetary) Poverty lines and local price

- Stefano Marchetti, University of Pisa - Centre Dagum

Third workshop of the EU H2020 MAKWSELL		
project		
(Monetary) Poverty lines and local price levels		
S. Marchetti ^{1,2} L. Biggeri ² C. Giusti ^{1,2} M. Pratesi ^{1,2}		
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² Interuniversity Research Center 'Camilo Dagum' on Advanced Statistics for the Equitable and Sustainable Development		
Barcelona, 5 March 2020		
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Session 2: on-going EU-wide research activities related to MAKSWELL project themes

How to translate cultural and language-related factors into social indicators to measure discriminations and its effects on inequalities

- Valeria Bello, , Blanquerna-Ramón Llull University, Spain



The Atlas of Household Income Distribution (ADRH)

- Antonio Argüeso, INE, Spain

