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THE 2020 NATIONAL ACCOUNTS BENCHMARK REVISION

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Vanessa Dimech and Owen Grech

Introduction

Most macroeconomic data are revised to update initial estimates and provide a more accurate reading of economic developments. There are two types of revisions: routine revisions and major revisions. Routine revisions occur regularly, in many cases with each new data vintage that is published, and generally involve updating earlier estimates with more accurate data, even if such data are available with a longer lag. Major revisions can be further subdivided into major ad hoc revisions and major regular revisions, with the latter also referred to as benchmark revisions.

Major ad hoc revisions take place when the need arises, generally resulting from methodological changes, such as the introduction of a new European System of Accounts (ESA) and changes in classifications, or special events such as an enlargement of the European Union. Major regular revisions, on the other hand, occur recurrently, generally every five to ten years, to incorporate changes in data sources or estimation techniques.²

In August 2020, the National Statistics Office (NSO) carried out a benchmark revision in national accounts data. To provide consistent data, the entire time series was updated. Therefore, revisions to nominal data were extended back to 1995, while real data were revised to the year 2000.³ Prior to this, the last benchmark revision was held in October 2014 and was integrated with a major ad hoc revision following the introduction of ESA 2010.⁴

The 2020 benchmark revision brought about several enhancements, which continued to improve the accuracy and richness of national accounts data, and harmonised further the data with that of other countries, thus allowing for better international data comparability. This article provides an overview of the salient enhancements incorporated in the benchmark revision and the impact these had on the main aggregates of the national accounts.⁵

Integrating Household Budgetary Survey (HBS) results

The benchmark revision incorporated the results of the 2015 HBS.⁶ This had two direct effects. First, the HBS is the main source used for the compilation of certain NACE categories under the production approach. In particular, the HBS results were integrated in cultural education (NACE P85.52), medical and dental practice activities (NACE Q86.2), other human health activities

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² For a study on revisions to GDP data in Malta, see Grech, O. (2018), "An Analysis of Revisions to Maltese GDP Data", *Research Bulletin 2018*, Central Bank of Malta.

³ The benchmark revision was published alongside the GDP for 2020Q2. Therefore, the data can be found in NSO's *News Release 142/2020*, "Gross Domestic Product: Q2/2020".

⁴ For further detail, see NSO (2014), *A New Framework for National Accounts*.

⁵ This article summarises an earlier paper. Additional detail can be found in NSO (2020), *Benchmark Revision 2020*.

⁶ See NSO (2018), *Household Budgetary Survey Malta 2015*.

(NACE Q86.90), fitness facilities (NACE R93.13), hairdressing and other beauty treatment (NACE S96.02), as well as physical well-being activities (NACE S96.04). The impact on these categories is provided in Table 1.

Second, the HBS is also the primary source used for the compilation of Household Final Consumption Expenditure (HFCE) under the expenditure approach. Table 2 shows the revisions to the main HFCE divisions brought about by the integration of the HBS results.

In both cases, since the previous HBS was carried out in 2008, the results of the 2015 HBS were extrapolated backwards to 2009 to derive a consistent time series. However, in some cases, the time series had to be revised from 1995 or 2000 onwards to ensure consistency. Moreover, the 2015 HBS results were used as a new benchmark to extrapolate data from 2016 onwards.

Table 1
REVISIONS IN GROSS VALUE ADDED IN NACE CATEGORIES RESULTING FROM THE INTEGRATION OF THE HBS⁽¹⁾

EUR millions

	1995	2000	2005	2010	2015	2016	2017	2018	2019
Cultural education	-0.1	-0.2	-0.3	-0.3	5.0	1.4	1.6	2.1	2.3
Medical and dental practice activities	0.0	0.0	0.0	4.1	12.1	16.4	18.1	14.4	14.6
Other human health activities	0.0	0.0	0.0	0.3	-7.0	-8.5	-8.9	-10.6	-11.8
Fitness facilities	0.0	0.0	0.0	0.1	0.4	0.5	0.7	0.6	0.7
Hairdressing and other beauty treatment; physical well-being activities	3.4	4.5	0.6	1.8	1.3	1.0	1.0	1.3	1.7
Total	3.3	4.3	0.3	5.9	11.8	10.8	12.5	7.7	7.5

Source: NSO.

⁽¹⁾ Totals might not add up due to rounding.

Table 2
REVISIONS IN HOUSEHOLD FINAL CONSUMPTION EXPENDITURE RESULTING FROM THE INTEGRATION OF THE HBS⁽¹⁾

EUR millions

COICOP Code		1995	2000	2005	2010	2015	2016	2017	2018	2019
1	Food and non-alcoholic beverages	1.4	1.6	44.7	101.3	148.7	122.5	119.4	135.9	130.3
2	Alcoholic beverages, tobacco and narcotics	0.0	0.0	0.1	-1.4	0.8	-1.0	-2.8	0.5	0.7
3	Clothing and footwear	0.0	0.0	0.0	38.3	72.6	70.1	88.5	87.4	118.3
4	Housing, water, electricity, gas and other fuels	24.2	13.9	3.2	75.7	100.7	132.4	177.3	148.6	133.4
5	Furnishings, household equipment and routine household maintenance	-0.3	-0.4	0.4	-1.0	-101.5	-113.5	-121.6	-135.9	-137.5
6	Health	0.3	0.5	-11.2	-7.9	27.0	29.9	38.7	48.5	49.1
7	Transport	28.5	35.4	31.6	57.6	6.9	27.7	34.9	49.5	66.2
8	Communication	-17.6	-40.7	-15.0	-18.1	-26.1	-16.8	-17.7	-15.1	-13.7
9	Recreation and culture	12.9	22.2	-19.9	-38.5	-43.9	-48.4	-35.3	-24.7	-17.7
10	Education	5.1	10.1	14.6	21.2	33.2	48.0	50.7	54.2	59.0
11	Restaurants and hotels	0.6	3.8	34.3	42.9	84.0	99.6	79.7	57.1	96.3
12	Miscellaneous goods and services	-8.8	-13.0	-6.9	-99.2	-70.1	-97.4	-141.0	-67.4	37.8
	Total	46.4	33.3	75.9	170.9	232.4	252.9	270.7	338.5	522.1

Source: NSO.

⁽¹⁾ Totals might not add up due to rounding.

Addressing reservations and action points

The benchmark revision also incorporated work on three reservations which resulted from the ESA 1995 verification cycle and which were addressed after the 2014 benchmark revision.^{7, 8, 9}

It also tackled several action points which were identified during the first ESA 2010 verification cycle.¹⁰ These are:

- Action point A2 – Compile data for financial leasing (NACE K64.91).
- Action point A5 – Compile data for activities of households as employers of domestic personnel (NACE T97).
- Action point A6 – Separately identify costs of ownership transfers on non-produced assets as GFCF. This includes real estate agent fees, stamp duty and notary fees on transfer of land (AN.211), and notary and legal fees on transfer of contracts, leases and licences (AN.22), as well as on purchases less sales of goodwill and marketing assets (AN.23).
- Action point A11 – Compile data on withdrawals of income from quasi-corporations (D.422), that is, housing services provided by owner-occupied holiday homes abroad.
- Action point A13 – Measure changes in inventories (P.52) net of holding gains and losses, that is, taking into account possible increases or decreases in their value due to changes in prices.
- Action point A21 – Include the expenditure on research and development (R&D) by scientific research and development (NACE M72) in the calculation of R&D once supply and use tables are finalised.
- Action point B1 – Record decommissioning costs in the year they are incurred as GFCF, with consumption of fixed capital recorded for the same amount. As a result, the decommissioning costs of the Marsa power station were included in the figures for 2015.
- Action point B2 – Address the high share of GVA in agriculture produced within the general government sector. This was due to the misclassification of certain cost centres under crop and animal production, hunting and related service activities (NACE A1) and fishing and aquaculture (NACE A3) instead of under public administration and defence; compulsory social security (NACE O84).
- Action point B3 – Include acquisitions or disposals of non-monetary gold, platinum, silver, etc. in acquisitions less disposals of valuables (P.53).

Following the integration of these action points, in comparison with the previous vintage, GNI decreased by 0.4 per cent, on average, between 2010 and 2018.¹¹ The individual impact of these action points on GNI is presented in Table 3. Action points A5 and A13 had the largest effect on GNI, with the remaining action points having no significant impact.

⁷ A verification cycle is a process whereby the European Commission statistical agency Eurostat verifies the procedures and basic statistics used by Member States in the calculation of Gross National Income (GNI) which, in turn, is used to calculate part of the European Union's 'own resources' used to finance its expenditure. Verification cycles last around five years and are linked to the introduction of a new ESA.

⁸ The Commission places a reservation when it believes that improvements should be made to the methodology underlying a particular aspect of a Member State's GNI data.

⁹ The reservations relate to methodological enhancements in the estimation of Financial Intermediation Services Indirectly Measured (FISIM), integrating Short-Term Statistics (STS) in the compilation of restaurants and mobile food service activities and beverage serving activities, and measuring changes in inventories net of holding gains and losses. These are discussed further on since the first two were encompassed within broader methodological changes, while the latter was also an action point.

¹⁰ Periodically, GNI information visits are carried out in Member States, during which the Commission and representatives from other Member States collect additional information to determine whether there are any weaknesses in the GNI inventory, which documents the sources and methods used to calculate GNI and its components. Following such a visit, a report is drawn up with action points for the Member State to introduce methodological improvements or to clarify or supplement the information provided in the GNI inventory.

¹¹ Note that although, for brevity, data for the most recent years are shown, in many cases, ensuring consistent data involved revising the entire time series.

Table 3
IMPACT OF ACTION POINTS ON GNI

Per cent of GNI

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Action point A2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Action point A5	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1
Action point A6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Action point A11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Action point A13	0.5	-0.8	-0.3	0.0	-0.5	-0.1	-0.5	-0.1	-0.3
Action point A21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Action point B1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Action point B2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Action point B3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.3	-1.0	-0.5	-0.2	-0.7	-0.2	-0.6	-0.2	-0.4

Source: NSO.

Other methodological changes

Other methodological changes, largely related to methodological refinements and the integration of new data sources, were also carried out. The most notable are the revisions to:

- Financial and insurance activities (NACE K), as a result of methodological improvements in the calculation of FISIM, activities of holding companies (NACE K64.2), trusts, funds and similar financial entities (NACE K64.3) and reinsurance (NACE K65.2), as well as the incorporation of administrative data.¹²
- Real estate activities (NACE L), in particular actual residential rents, imputed residential rents and non-residential rents. The revision to actual residential rents reflects the integration of the latest HBS results, which were augmented to reflect updated population figures, as well as the inclusion of commissions paid to real estate agents in intermediate consumption.¹³ Imputed rents and non-residential rents were revised due to several methodological enhancements.
- Fishing and aquaculture (NACE A3), reflecting the redistribution of quarterly output, such that it is recorded as being produced continuously over the entire period of production, rather than when fish is exported or sold, as well as the integration of the results of the annual census on open-sea fishing, conducted by the Department of Fisheries and Aquaculture, for the years 2008 onwards.
- Other accommodation (NACE I55.9), where output is now derived directly from a tourist expenditure survey in the case of non-residents, and from the National Tourism Survey in the case of residents.
- Electricity, gas, steam and air conditioning supply (NACE D35), following the inclusion, for the first time, of renewable energy generated by households, based on administrative data for the years 2010 onwards, which is supplemented by data from the SBS survey.
- Restaurants and mobile food service activities (NACE I56.1) and beverage serving activities (NACE I56.3), since the latest HBS results on the output consumed by residents are now extrapolated from 2016 onwards using STS.
- Education (NACE P85), creative, arts and entertainment activities (NACE R90) and sports activities and amusement and recreation activities (NACE R93), as a result of the integration of administrative data.

¹² FISIM is an indirect measure of the value of services provided by financial intermediaries, such as banks, for which no explicit charge is levied. These services are instead paid for through the margin between interest rates offered to savers and interest rates charged to borrowers.

¹³ The updated population figures are published in NSO's *News Release* 022/2018, "Population Statistics (Revisions): 2012-2016".

Together, these methodological changes resulted in an increase in GDP by an average of 3.0 per cent between 2010 and 2018, when compared with the previous vintage.¹⁴ The main contributors were the revisions to financial and insurance activities, and real estate activities.

Addressing derogations

A number of derogations were also addressed in the benchmark revision. First, data on hours worked at a sectoral level for the 1995 to 1999 period were compiled. Since the usual source of data on hours worked – the LFS – only extends back to 2000, the data had to be populated through back-casting.

Second, the cross-classification of fixed assets by industry and by asset (stocks) was published for the first time. This dataset includes the gross and net capital stock of fixed assets (AN.11) at current and previous year's replacement costs by industry, with disaggregated data for 21 industries. The asset breakdown includes dwellings (AN.111), other buildings and structures (AN.112), machinery and equipment, and weapons systems (AN.113 + AN.114), cultivated biological resources (AN.115) and intellectual property products (AN.117). In addition, balance sheet data on non-financial assets (AN) were enhanced. Similarly, this dataset includes the net capital stock of non-financial assets at current prices by institutional sector. Previously, only data on dwellings were compiled. The dataset now includes all the other fixed assets. The perpetual inventory method was applied to derive asset stocks and consumption of fixed capital.¹⁵

Third, the Supply, Use and Input-Output Tables (SUIOT) for 2013, 2014 and 2015 were published. The supply table describes how goods and services are brought into the economy, either through domestic production or imports, while the use table explains how those same products are used in the economy across the main types of use, namely intermediate consumption, final consumption (by households, non-profit institutions serving households and general government), gross capital formation and exports. Symmetric Input-Output Tables (SIOT) are derived from the Supply and Use Tables (SUT) and show the relationships between inputs and outputs that are required to produce a given amount of goods and services. The industry-by-industry SIOT describes the interdependencies between industries, that is, the input of various industries that contribute towards the output of a particular industry, while the product-by-product SIOT – which was published for the first time – explains the product technology required to produce a given product, that is, the input of different products needed to produce a particular product.^{16,17}

Fourth, GDP data in real terms from the production approach were also published for the first time. This allows real economic developments to be interpreted at a sectoral level and serves as a useful cross-check on real data emerging from the expenditure approach. The chain-linking technique used to compile GDP in volume terms remains unchanged, namely the annual overlap method. This technique has the major advantage of maintaining consistency between quarterly and annual estimates, with the sum of the quarterly values within a year equal to the annual value.¹⁸ Eurostat's recommendations on price and volume measures were followed as

¹⁴ Again, although data for the most recent years are presented, in many cases, the entire time series was revised to ensure consistent data.

¹⁵ The perpetual inventory method is an approach that is commonly used to calculate the stock of fixed assets, where the stock in a given period is equal to the stock in the previous period plus investment, less depreciation.

¹⁶ Further detail on the SUIOT for 2015, including data, can be found in NSO's *News Release* 005/2021, "Supply, Use and Input Output Tables: 2015".

¹⁷ See United Nations (2018), *Handbook on Supply and Use Tables and Input-Output Tables with Extensions and Applications, Studies in Methods*, Series F No. 74, for additional detail.

¹⁸ For further detail on chain-linking and the annual overlap method within a national accounts context, see Eurostat (2013), *Handbook on Quarterly National Accounts*.

closely as possible and proxies were developed when data were unavailable.¹⁹ Since real GDP is now compiled from both the expenditure side and the production side, a balancing process is in place to ensure consistency between the two methods. This process takes into account the respective strengths and weakness of the two approaches.

Routine revisions

Routine revisions were also included, with the most important being the incorporation of the 2016 Structural Business Statistics (SBS) survey results and updated estimates for gambling and betting activities (NACE R92). These updates had an impact on the years 2016 onwards, since the new data were extrapolated to produce refined estimates for the entire time series. The net effect of these revisions on GDP is shown in Table 4.

SBS are collected through an annual survey which covers a range of variables, including turnover, costs and employment. Therefore, within the national accounts context, it is used to update the quarterly estimates of certain NACE categories.²⁰ The largest upward revisions were carried out in administrative and support service activities (NACE N), professional, scientific and technical activities (NACE M) and information and communication (NACE J), while wholesale and retail trade, repair of motor vehicles and motorcycles (NACE G) and transporting and storage (NACE H) witnessed downward revisions.

In the case of gambling and betting activities, estimates for 2016 were replaced with actual data, while, for subsequent years, the methodology used for producing estimates was improved.

Impact on headline GDP figures

As a result of the enhancements discussed, the level of nominal GDP increased, on average, by 1.3 per cent between 1995 and 2019, when compared to the previous vintage. Revisions in nominal GDP ranged from 0.1 per cent in 2002 to 3.8 per cent in 2013. Table 4 compares nominal GDP reported under the benchmark vintage to that published in the previous vintage, and decomposes the revisions into benchmark revisions and routine revisions.

With regard to growth rates, GDP growth in nominal terms was revised by 0.0 percentage points (that is, upward revisions broadly offset downward revisions), on average, between 1995 and 2019 (see Chart 1). Revisions to GDP growth in real terms also averaged 0.0 percentage points between

Table 4
DECOMPOSITION OF REVISIONS⁽¹⁾

EUR millions

	1995	2000	2005	2010	2015	2016	2017	2018	2019
Nominal GDP as per 2020Q2 vintage	3,040.7	4,136.9	5,149.3	6,599.5	9,656.6	10,369.7	11,321.7	12,402.8	13,277.3
Benchmark revisions	18.9	16.5	9.9	216.3	340.1	327.2	385.1	421.3	487.8
Routine revisions	0.0	0.0	0.0	0.0	0.0	-158.5	-69.2	-333.2	-375.0
Nominal GDP as per 2020Q3 (benchmark) vintage	3,059.7	4,153.3	5,159.3	6,815.8	9,996.7	10,538.4	11,637.7	12,491.0	13,390.0
Net revision	18.9	16.5	9.9	216.3	340.1	168.6	315.9	88.1	112.8
Net revision as a per cent of GDP	0.6	0.4	0.2	3.3	3.5	1.6	2.8	0.7	0.8

Source: NSO.

⁽¹⁾ Totals might not add up due to rounding.

¹⁹ More detail can be found in Eurostat (2016), *Handbook on Prices and Volume Measures in National Accounts*.

²⁰ SBS cover NACE Sections B to N, except K, and NACE Division S95.

2000 and 2019 (see Chart 2). The new path of GDP confirms the business cycle reported in the previous vintage.

Conclusion

The 2020 national accounts benchmark revision led to a number of enhancements, the most notable of which are: the publication, for the first time, of GDP data in real terms from the production approach; the publication of SUIOT for 2013, 2014 and 2015; the implementation of recommendations emerging from the ESA 1995 and ESA 2010 verification cycles; the incorporation of new data sources, including the latest HBS; and the adoption of refined estimation methods. Routine revisions were also carried out, most importantly, the integration of the 2016 SBS survey results and updated estimates for gambling and betting activities.

As a result of these improvements, the level of nominal GDP increased by 1.3 per cent, on average, over the entire time series. Average GDP growth, on the other hand, remained largely unchanged, in both nominal and real terms. The new GDP series follows a very similar path to that reported previously.

The benchmark revision improved the accuracy of national accounts data and served to harmonise the data further at an international level. Moreover, the revision contributed significantly towards enhancing the richness of the data, which will allow for deeper analysis and open avenues for further research. For instance, real GDP data can now be studied, not only from the expenditure side, but also at a sectoral level, while new multipliers based on the updated SUIOT can be estimated.

Going forward, the NSO will continue refining its current national accounts estimates, especially those for recent years, and expand the national accounts statistics that are compiled. This will ensure that the data continue to be an accurate measure of economic developments and a key contributor in the economic decision-making process, within the policy-making arena, the business community and beyond.

