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EUROSISTEMA

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pandemic on VAT revenue in Italy

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# MIND THE GAP! THE (UNEXPECTED) IMPACT OF COVID-19 PANDEMIC ON VAT REVENUE IN ITALY

by Francesco Berardini<sup>†</sup> e Fabrizio Renzi<sup>\*</sup>

## Abstract

The decline in VAT revenue during the Covid-19 recession has been unexpectedly lower than the drop in household consumption. In the first half of 2021, VAT bounced back to pre-crisis levels even though aggregate consumption had still not recovered. According to our analysis, this result reflected the peculiar nature of the pandemic crisis and the subsequent shutdown of retail shops and services, which has considerably affected consumer habits. Consumption of services, characterized by lower VAT rates and a lower degree of compliance, dropped massively, while spending on durable goods fell briefly at the onset of the crisis and then rose quickly to pre-crisis levels; moreover, the share of cashless payments has increased, both in physical stores and on-line. If the change in payment habits turned out to be permanent, this would lead to a structural reduction in the government deficit. Additionally, we provide preliminary evidence on the effect of electronic payments on reducing VAT tax evasion: a one-percentage point increase in the share of cashless payments results in approximately 0.4 per cent higher VAT revenue owing to increased compliance.

**JEL Classification:** H21, H26, E21, E32.

**Keywords:** Covid-19, household behavior, consumer preferences, value-added tax, vat compliance, vat gap, payment habits, cashless payments.

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## 1. Introduction<sup>1</sup>

Value added tax (VAT) is a consumption tax levied on most goods and services that are bought and sold for use or consumption. The amount of VAT to be paid is based on gross margin at each point in the process of manufacturing and it is charged based on the cost of the product less any costs used in the production. VAT revenue developments follow the evolution of the macroeconomic base, which is typically approximated by private consumption expenditure. The responsiveness of VAT to changes in its macroeconomic base is captured by the related elasticity, which is often assumed to be one.

Since the outbreak of the Covid-19 crisis, VAT revenue, adjusted for the impact of tax deferrals that took place in 2020, fell less than the contraction of household consumption. This difference has grown up to 9 percentage points in the

In this work we investigate the determinants of VAT revenues in the context of the Covid-19 crisis by providing some insights on the factors underlying this result. Our findings suggest that two factors supported VAT revenues: consumption habits changed, as the pandemic shifted demand away from services toward durable goods, leading to an implicit reduction of the so-called policy gap; VAT compliance increased (i.e. compliance gap decreased), also on account of the surge of cashless payments.

Concerning consumption habits, during past recessions durable goods spending has slowed gradually and has taken several years to reach its pre-crisis levels. Conversely, at the onset of the Covid-19 crisis purchases of durable goods contracted briefly and rose quickly thereafter. At the same time, lockdowns and health policy measures have affected consumption of services (travelling, eating, etc.). The substitution between services and durable goods led in turn to an increase in the overall level of compliance, as tax evasion is higher in the sectors most heavily hit by recent restrictions<sup>2</sup>. In this respect our analysis suggests that, on account of the unusual macroeconomic developments caused by the Covid-19 pandemic, the overall VAT compliance has increased; we show that this result is a consequence of the shutdown of those sectors with higher propensity to tax evasion and of the rise in the share of cashless payments both in physical stores and through e-commerce<sup>3</sup>.

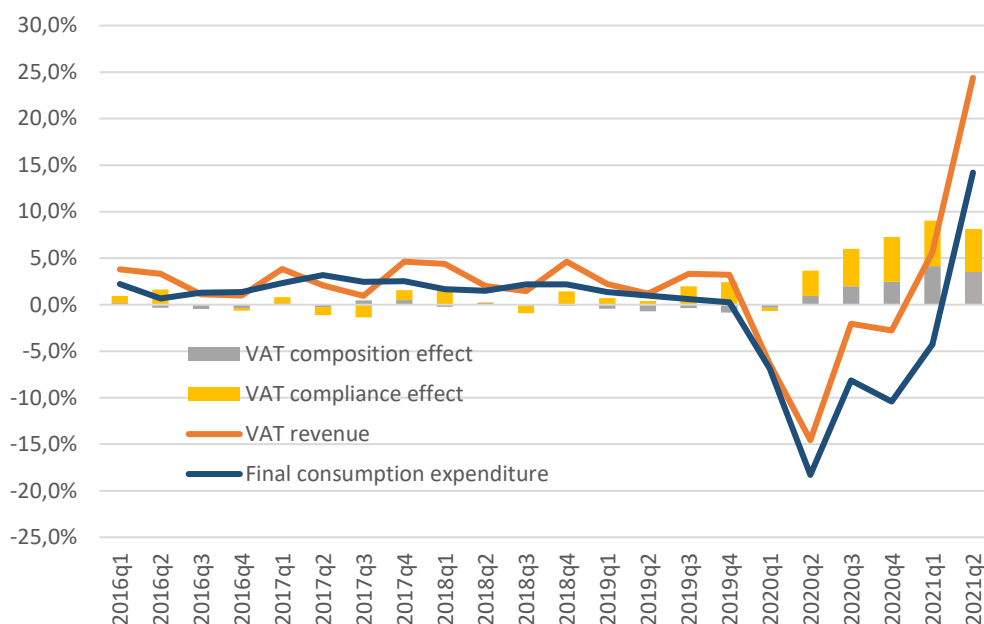
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<sup>2</sup> Istat (2020), page 4.

<sup>3</sup> It is worth noting that the introduction of the Italian “cashback” program could have affected the propensity to use cashless instruments in the first half of 2021.



**Figure 1: VAT revenue and final consumption expenditure**  
(Quarter on same quarter a year ago - % changes)



Source: quarterly national accounts (Istat) and VAT revenue (State Treasury Service - Bank of Italy).

The paper is organized as follows. Section 2 outlines the key concepts and definitions of value added tax gap and presents a brief review of the literature on the VAT revenue response to business cycle. Section 3 discusses the effects of changes in consumption basket on VAT revenue in the context of the Covid-19 crisis. Section 4 outlines the methodology used for the estimation of the overall VAT compliance and investigates the main drivers. Sections 5 and 6 present our empirical results. The last section concludes the paper by discussing our main findings and policy implications.

## 2. Literature review

VAT is a general tax on consumption. Considering that VAT revenue mainly stems from private consumption, the most common approach relies on the use of household consumption as proxy for the tax base. Once netted out for the impact of policy-induced tax changes (i.e. discretionary measures), the elasticity of VAT revenue with respect to consumption is often assumed to be one in the long-run (Price et al., 2014; Mourre and Princen, 2015; Simon and Harding, 2020). Under this assumption, VAT reacts proportionally to changes in its macroeconomic base. Deviations from the unitary hypothesis imply some progressivity (i.e. elasticity above unit) or, on the contrary, a regressive tax system (i.e. elasticity below one). A progressive tax system typically relates to lower VAT rates applied to basic goods and higher rates applied to luxury goods: an increase in the aggregate consumption expenditures implies, ceteris paribus, a rise in the spending for luxury goods which in turn expands VAT revenue more than proportionally. On the contrary, an elasticity below unity could be justified when lower VAT rates are applied to the most volatile components of the consumption basket.

Tax elasticities are usually assumed to be constant over time; nevertheless, many authors provided evidence of short-term fluctuations over the business cycle. For instance, Poghosyan (2011) shows that VAT elasticity varies in the short run in a range estimated between 0.5 and 1.5. Sancak et al.



(2010) and Ueda (2017) use output gap as control variable in order to assess the effect of business cycle on VAT revenues. Using an error correction model for the estimation of long and short-term elasticities in a dynamic setting, they provide evidence that elasticities not only may differ from unity depending on the state of the economy but may also behave in an asymmetrical manner.

The relationship between VAT revenue and private consumption is not stable over time mainly owing to variations of VAT gap. The latter can be defined as the difference between potential and actual revenue. Within this framework, the literature defines (appendix, Figure A.1):

- Reference potential revenue: calculated as the potential VAT collections in the case of perfect compliance and by applying the standard rate to all final consumption ( $VAT_{pot.ref_t}$ );
- Current potential revenue: estimated as the potential VAT revenue with perfect compliance using the rates under the current policy setting ( $VAT_{pot_t}$ );
- Actual revenue: which represents the observed VAT collections ( $VAT_t$ ).

The VAT gap can be decomposed into two main components:

- 1) *Policy gap*: calculated as the difference between  $VAT_{pot.ref_t}$  and  $VAT_{pot_t}$ ;
- 2) *Compliance gap*: equal to the gap between  $VAT_{pot_t}$  and  $VAT_t$ .

This approach allows policy makers to isolate the effects of policy choices on the VAT gap from those due to non-compliance by providing a measure of the relative contribution of these factors to the overall tax gap. The estimation of both *policy* and *compliance gap* relies on the calculation of  $VAT_{pot_t}$ . The most common approach (*top-down approach*) uses the statistical data included in the national supply and use tables (SUTs) to estimate potential VAT collections. These data are organized as matrices - by product and industry - describing how domestic production and imports are used by industries for intermediate consumption and final use. Therefore, this approach allows to track the production process and to estimate the theoretical amount of VAT that should be collected. Since SUTs data are published with a significant lag (almost two years after the end of the reference period), this methodology cannot be used to produce real time estimates of the VAT gap. Hence, we propose a simplified approach in order to approximate the quarterly and annual VAT gap figures for 2020 and the first half of 2021:  $VAT_{pot.ref_t}$  and  $VAT_{pot_t}$  are estimated by applying the average statutory VAT rate for each sector to the sectoral breakdown of quarterly final consumption (section 3 and 4).

As discussed, the *policy gap* represents the effect of applying exemptions on the standard rate and, therefore, it is a measure of the additional VAT revenue that could be levied if a constant VAT rate were applied to all goods and services. The *policy gap* can increase (or decrease) following modifications in the structure of VAT rates but also as a consequence of changes in consumer habits<sup>4</sup>; for example a shift in consumer preferences towards basic goods and services implies a reduction in the average rate, corresponding to a rise of the VAT gap and a reduction in VAT revenues. These effects are normally positively correlated with the business cycle fluctuations as higher rates are applied to those goods and services more responsive to macroeconomic changes (Ueda, 2017).

<sup>4</sup> The literature refers to such developments as “*behaviour-induced changes in policy gaps*”.

Typically, during recessions, spending in durable goods decreases causing VAT revenue to fall quicker than overall consumption expenditure.

With respect to the *compliance gap*, the economic theory suggests that the degree of compliance is the result of taxpayers' cost-opportunity decisions. From a micro perspective, individual tax evasion implies a comparison between the taxation cost and the penalty cost related to the probability of being investigated by the tax authorities (Allingham and Sandmo, 1972). At macro level, there are key structural factors affecting the degree of tax evasion like the urbanization level, the share of agriculture, trade openness and the overall level of regulatory quality and government effectiveness (Aizenman and Jinjarak, 2008; De Mello, 2009, Szczyńska, 2019). In this context, Carfora et al. (2020) suggest that the collection efficiency is impacted by additional factors such as the share of domestic production of goods and services for final consumption, the fragmentation of production activities and the perceived level of public sector corruption. Finally, Immordino and Russo (2018) show that cashless payments hamper tax evasion in light of the greater level of traceability of these payment methods as opposed to cash settlement.

In the short-run the compliance gap is affected by fluctuations of the business cycle (Ueda, 2017; EC, 2020). The related literature has provided theoretical and empirical evidence of a drop in tax compliance during economic downturns. In recession, credit-constrained taxpayers may resort to tax evasion as an alternative financing source or may be tempted to underestimate risks of tax evasion compared to the potential gains. Compliance is also expected to decline during an economic downturn as a shift in economic activity from the formal to informal sector occurs. These conditions could be strengthened if taxpayers realize that policy makers are less stringent in enforcing tax laws or if there is a perception that other people are evading more, making in turn tax collection less effective (Brondolo, 2009).

Against this background, in economic downturns government VAT revenue is usually expected to fall more than household consumption (implying an elasticity greater than one) as tax compliance drops and consumers reduce the demand of durable goods. Therefore, following the outbreak of the Covid-19 recession, the VAT gap was forecasted to increase on account of a reduction in the overall VAT compliance (EC, 2020)<sup>5</sup>.

<sup>5</sup> The European Commission VAT gap report published in September 2020 stated: “*Since the COVID-19 recession will have a direct impact on the EU economies, the VAT Gap in 2020 is forecasted to increase. [...] The hike in 2020 could be more pronounced than the gradual decrease of the Gap observed over the three preceding years.*” The estimation of the VAT gap for 2020 relies on an econometric model.

### 3. Consumption habits: a measure of the effects on VAT and recent trends in the aftermath of Covid-19 crisis

In order to assess the impact of a shift in consumer preferences we use the following equation:

$$VAT\_Comp_t = \frac{VAT_{pot_t} - VAT_{pot_t}^*}{VAT_{pot_t}}$$

Where  $VAT_{pot_t}$  and  $VAT_{pot_t}^*$  are computed by applying the average statutory VAT rates to the quarterly national accounts data on private final consumption expenditure by durability<sup>6</sup>, under the assumption of perfect tax compliance.  $VAT_{pot_t}$  represents the actual potential revenue under the current policy framework, estimated using information of spending in goods and services embedded in national accounts data<sup>7</sup>.  $VAT_{pot_t}^*$  expresses a theoretical potential VAT collection in absence of any shift in consumer preferences. In other words  $VAT_{pot_t}^*$  expresses the amount of VAT that would be collected if all the expenditure components (i.e., durables, non-durables, semi-durables, services) increase at the same annual growth rate<sup>8</sup>. Hence, the variable  $VAT\_Comp_t$  captures the “VAT composition effect”, defined as the change in VAT revenue caused by a shift in the composition of consumption basket, regardless of the overall level of consumption; it is positive (i.e. average rate and VAT revenue increase) when policy gap reduces (Appendix).

Any shift in the composition of aggregate household spending induces a change in the VAT revenue proportional to the difference among the average VAT rates<sup>9</sup> of the groups defined in Table 1.

**Table 1: Average statutory VAT rates**

Goods/services	Average VAT rates
Durable goods	21,2%
Semi-durable goods	20,6%
Non-durable goods	11,9%
Services	6,9%

Source: Our calculations based on National Accounts Data (Private Consumption – Coicop)

<sup>6</sup> The average theoretical VAT rates are computed using the annual household consumption data in accordance with the Classification of Individual Consumption according to Purpose (Coicop). This classification, developed by the United Nation Statistics Division, divides consumption into 12 main subgroups with the aim of providing a framework of homogeneous categories of goods and services, which are considered as a function or purpose of household consumption expenditure. Each subgroup is further broken down into more detailed categories and different type of products compose each category. For analytical purposes, normally the 12 subgroups are aggregated into four main classes showing consumption by durability – durable goods, semi-durable goods, non-durable goods and services. By applying to each subgroup/category the statutory VAT rate, we derive the average rate for the four macro-category as weighted average of each group (Table 1).

<sup>7</sup> The calculation of the potential VAT collectable on the other GDP components (e.g. intermediate consumption, private investment, government final consumption expenditure) allows for a percentage of output in a given sector that is exempt from VAT (i.e. propex – Appendix).

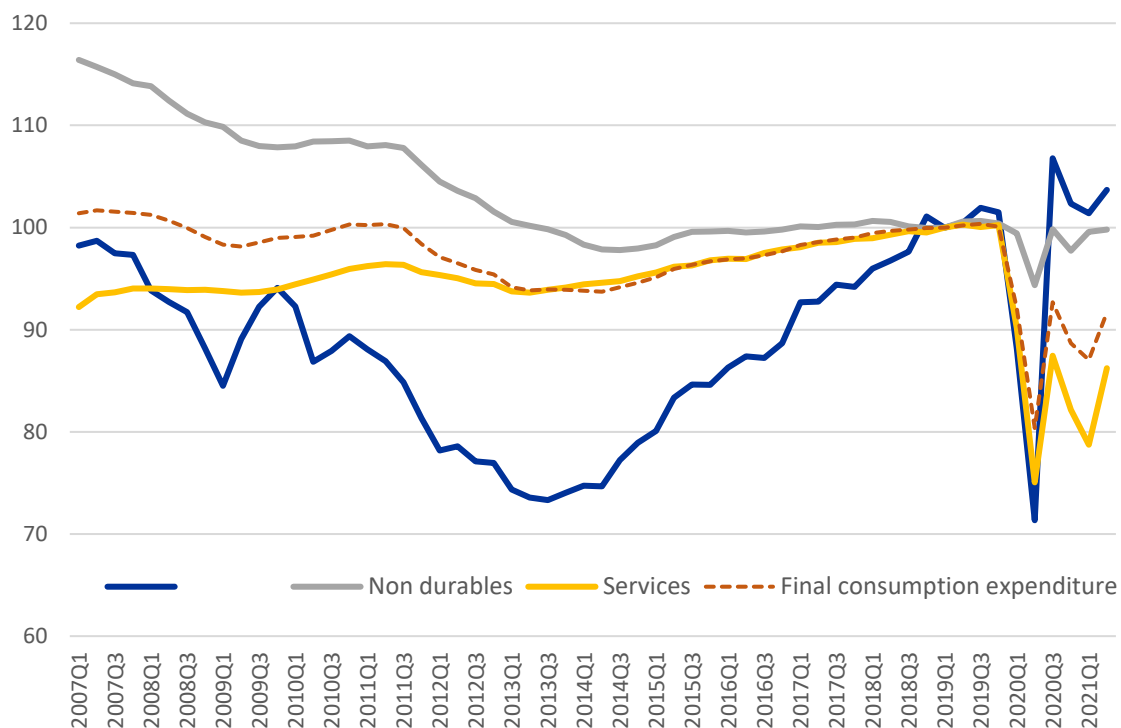
<sup>8</sup>  $VAT_{pot_t}^*$  is computed assuming a fixed composition of household expenditure which can be obtained multiplying each of the four main categories by the yearly growth rate of aggregate final consumption.

<sup>9</sup> For instance, a reduction of 1 per cent in the share of non-durable goods and a corresponding increase of 1 per cent in the share of durable goods causes potential VAT to rise by almost 1 per cent.

In past downturns, the VAT composition effect acted as expected: consumption of durables experienced wide and rapid drops (with negative effects on VAT revenues), while the observed effect on non-durable goods and services were negligible. Indeed, during the European sovereign debt crisis spending on durable goods declined sharply by almost 20 percentage points and suffered a slow recovery with a sluggish growth continuing over a prolonged period of time: only in 2017 households' expenditure on durable reached pre-crisis levels.

The pandemic crisis has given rise to unusual developments. Among others, precautionary measures taken by government authorities altered consumers' behaviour, leading to sudden changes in the composition of household spending. Following the adoption of several containment measures, purchases of services fell sharply starting from the second quarter of 2020 and their recovery has remained subdued<sup>10</sup>. In contrast, durable goods spending contracted briefly at the onset of the pandemic but increased sharply thereafter, exceeding pre-crisis levels despite a persistent lower level of aggregate consumption (Figure 2). In this respect, extraordinary fiscal policy measures may have triggered a further increase in durable goods spending, by increasing consumers' disposable income<sup>11</sup> (Tauber K. & Van Zandweghe W., 2021). Such substitution between durable goods and services entailed a growing reduction of the policy gap, resulting in positive  $VAT\_Comp_t$  (Figure 3).

**Figure 2: Consumption by durability**  
(Seasonally adjusted values, constant prices; reference quarter: 2019-Q1=100)

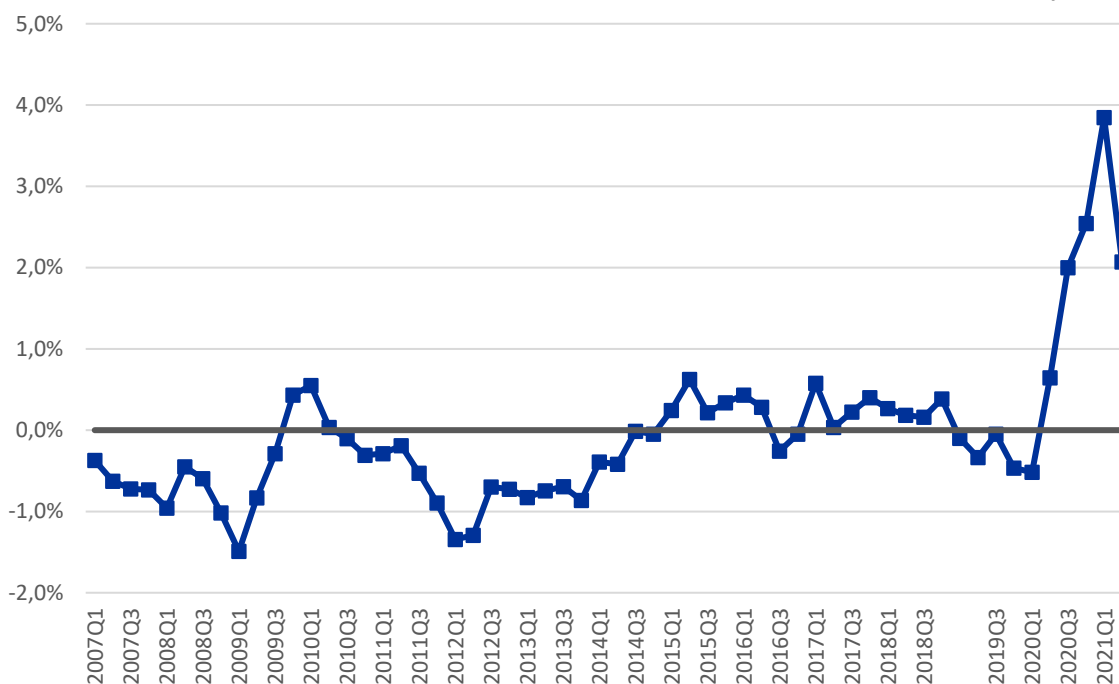


Source: Own calculations based on quarterly national accounts (Istat)

<sup>10</sup> The literature most commonly defines this aspect as service driven crisis (Beraja & Wolf 2021).

<sup>11</sup> In 2020, household disposable income fell by around 3 percentage points compared with a 9 percentage points drop in GDP (Bank of Italy, 2021). This is significantly different from developments during the two previous euro area recessions, when real disposable income declined significantly despite a much smaller drop in compensation of employees.

**Figure 3: Potential VAT revenue due to composition effect ( $VAT\_Comp_t$ )**



Source: Own calculations based on quarterly national accounts (Istat).

Overall, our findings suggest that the VAT composition effect contributed positively to the potential VAT revenue with an estimated impact of above 1 per cent in 2020 (with larger effects in the second half of the year) and of about 3 per cent in the first half of 2021.

#### 4. VAT-compliance gap: a simplified measure and recent developments

In line with the literature, we define the compliance gap ( $GAP_t$ ) as follows:

$$GAP_t = \frac{VAT_{pot_t} - VAT_t}{VAT_{pot_t}}$$

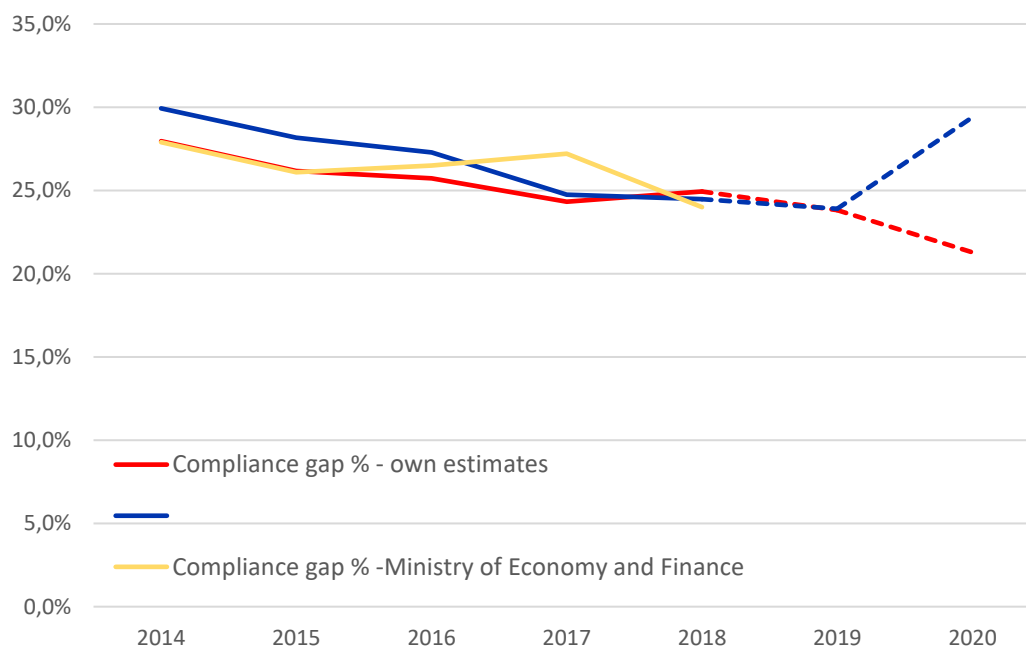
Where  $VAT_{pot_t}$  represents the estimated amount of VAT that is theoretically collectable based on the current VAT legislation assuming perfect compliance;  $VAT_t$  expresses the amount of VAT actually collected.

As mentioned before, the latest official update of the Italian compliance gap includes estimates up to 2019 (Section 2)<sup>12</sup>. Therefore, for 2020 we present a simplified methodology able to produce fast estimates of the potential VAT revenues using the breakdown of national accounts data on final

<sup>12</sup> For 2020, European Commission published some preliminary estimates (September 2020 report) pointing to an increase of VAT gap on account of Covid-19 recession (see footnote 5). On the contrary, the update of Italy's stability program (published on 25<sup>th</sup> of September 2021) contained a preliminary assessment of the VAT gap in 2020 and 2021. According to the latter, the compliance is expected to increase in these years, in line with the conclusion of our paper. In this context, the VAT compliance gap is estimated as a residual, by comparing VAT revenue and consumption variations (in other terms, according to this methodology VAT revenue windfalls are entirely due to an increase in the overall level of compliance). On this account, the 2021 Budget Law established that the amount of resources coming from a structural increase of tax compliance should be allocated to tax reform.

consumption<sup>13</sup>. Contrary to expectations, we estimate a decrease of the VAT compliance gap in 2020 of about 2 per cent (Figure 4). In quarterly terms<sup>14</sup>, our estimates suggest a raise in VAT compliance starting from the second quarter of 2020 (Figure 1).

**Figure 4: VAT compliance gap**  
(% of potential VAT revenues)



Source: Own calculation based on Istat, CE (2020) and MEF (2020).

We can argue that the estimated reduction of the compliance gap stems from several factors acting in the same direction:

**a) The shift towards sectors with higher level of compliance**

The shift of consumer demand away from services toward durable goods supported VAT revenues in light of the higher rates to which durable goods are typically subjected. Furthermore, such substitution has increased the overall VAT compliance given the higher propensity to tax evasion in those sectors most affected by Covid-19 precautionary measures (D’Agosto and Santoro, 2019). Indeed, service sector accounts for almost 80 per cent of the shadow economy (Istat 2020, page 4). Within this sector, restaurants and hotels exhibited a massive reduction of their annual turnover (of almost 40 per cent)<sup>15</sup>; nevertheless, preliminary evidence suggests that such drop had only a marginal impact on the overall VAT revenues<sup>16</sup>.

<sup>13</sup> See section 3.

<sup>14</sup> The estimation of the VAT gap on quarterly basis follows the same approach used for the annual forecast. In this case, however, we use the breakdown of consumption expenditure (durables goods, non-durables goods, semi-durable goods and services) available in the quarterly national accounts. For each of these components, an average theoretical VAT rate is calculated using the annual household consumption data according to the Classification of Individual Consumption according to Purpose (Coicop).

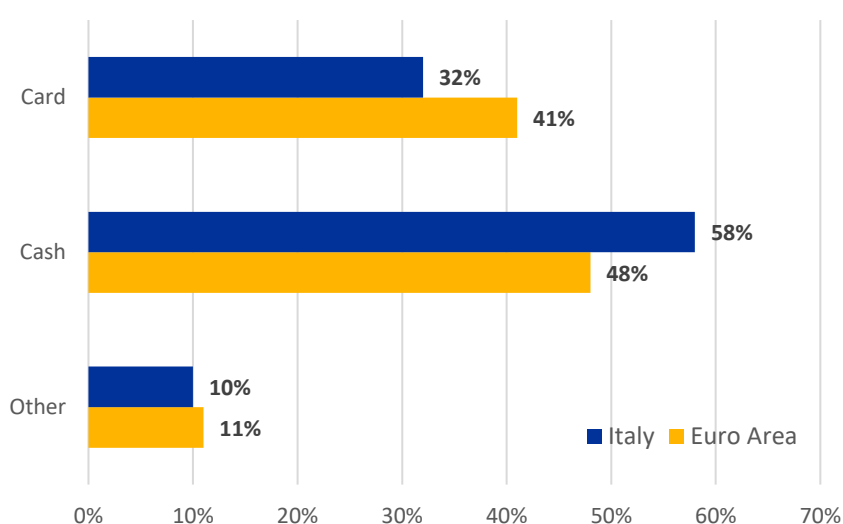
<sup>15</sup> Source: ISTAT, final private consumption expenditure according to COICOP classification.

<sup>16</sup> The comparison between the household consumption expenditure by sector and the related VAT flows requires to match two different datasets: private consumption is taken from the demand side of national accounts database which

## b) The increase in the share of cashless payments

According to the results of the latest ECB Study on Payment Attitudes of Consumers in the Euro Area (SPACE 2020)<sup>17</sup>, in 2019 the share of cash usage in Italy was around 58 per cent while 32 per cent of the volume of physical point of sale (POS) and person-to-person (P2P) transactions was carried out using cards as payment instrument (Figure 5). The other payment instruments (e.g. bank cheques, direct debits) account for the remaining 10 per cent of reported transactions. The SPACE results highlight the existence of significant differences in consumers' payment behaviour across the euro area countries. In the case of Italy, consumers still predominantly use cash for POS and P2P payments, with the share of non-cash payments instruments usage being almost 10 percentage points lower than the euro area average (Rocco, 2019).

**Figure 5: Share of payment instruments at POS and P2P**  
(value)



Source: European Central Bank (2020).

With the aim of assessing the propensity to use cashless payments in 2020, we employed quarterly credit institutions' data on POS and P2P transactions made with debit and credit cards. Once expressed as a share of overall consumption expenditure<sup>18</sup> these figures are consistent with the main findings of the SPACE report<sup>19</sup>. As shown in Figure 6, following the outbreak of the Covid-19

follows the Coicop classification, while VAT revenue are sourced from sector level data provided by the Italian Revenue Agency according to the classification of economic activity (ATECO). Therefore, some caution is required in mapping the two sources. A rough comparison shows that in 2019 the expenditure for restaurants and hotels accounted for almost 10 per cent of total spending while the VAT collected from these activities was equal to only 1 per cent of the overall VAT revenue. The presence of lower VAT rates for these services can only marginally explain this significant discrepancy. Moreover, the overall VAT paid by this sector appears to be inconsistent with the value added generated by these activities (around 65 billion in 2019). These data provide some insights on a higher propensity to tax evasion in those sectors most hit by the crisis although further analysis would be needed to estimate the degree of VAT compliance in each sector.

<sup>17</sup> A similar survey was conducted in 2016 – SUCH (Esselink & Hernández, 2017).

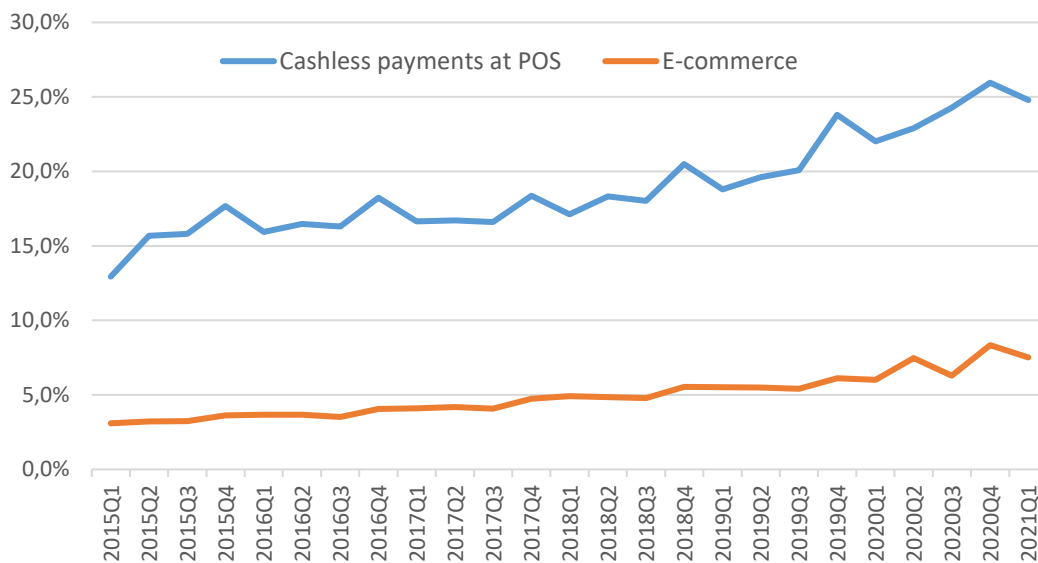
<sup>18</sup> The underlying assumption is that cashless payments are used mainly by households. Therefore, we assume that the transactions associated with other GDP components (e.g. intermediate consumption, private investment and government final consumption) are carried out through other payment instruments, like bank transfer.

<sup>19</sup> In our estimates the ratio between cashless payments and household consumption equals to around 30 per cent in 2019, while in the SPACE report this ratio is equal to about 32 per cent.



pandemic the share of non-cash transactions has increased. In this respect, Ardizzi et al. (2020) provide evidence of a large and persistent substitution effect from cash to card-based transactions as fear of infection has affected payment choices from the demand-side boosting consumption with non-cash instruments. Moreover, in a more recent study they show how the fear of infection prompted retailers to ask customers to wear masks and maintain physical distancing, triggering an increase in the use of cards and encouraging more innovative payment technologies (e.g. contactless cards). Furthermore, e-commerce boomed in second and fourth quarter of 2020, when Government imposed more stringent restrictions on movements (Ardizzi et al., 2021).

**Figure 6: Cashless payments**  
(% of household consumption)



Source: Supervisory reporting data (Bank of Italy)

### c) Measures to foster tax compliance

In the last years, the Italian tax authorities introduced several measures in order to fight tax evasion and increase VAT compliance. In this context, the new electronic invoicing system and the obligation to issue an electronic receipt could represent additional factors able to explain the reduction of the VAT gap from 2020.

From 1<sup>st</sup> January 2019 it has become mandatory to issue an electronic invoice following the sale of goods and rendering of services for transactions between private individuals<sup>20</sup> carried out between subjects residing or established in Italy. According to the Revenue Agency, the introduction of this new mechanism should have increased VAT compliance in 2019. However, because of possible delays in the implementation of taxpayers' IT systems, e-invoicing process may have affected positively VAT revenues also in 2020.

From 1<sup>st</sup> July 2019, the obligation to issue an electronic receipt comes into force for subjects conducting retail trade and similar activities with a turnover exceeding 400,000 euros and that,

<sup>20</sup> Only "small agricultural producers" and operators (businesses and self-employed persons) that fall within the so-called "advantage regime" and those that fall within the so-called "flat-rate regime" are exempt from the obligation to issue an electronic invoice.

currently, are not obliged to issue an invoice to customers, unless the document is requested by the customer; for all others the obligation started from 1<sup>st</sup> January 2020. With the introduction of the electronic receipt, operators will now have quick and easy access to data on their sales, which will be transmitted directly to the Italian Revenue Agency, with the possibility of more timely checks and quicker analysis of possible risks of tax evasion. In order to issue the electronic receipt it is necessary to use digital cash registers that communicate constantly with the Revenue Agency. According to official estimates, the obligation to issue an electronic receipt should have increased VAT revenues by about 1 percentage point from 2020.

## 5. The determinants of VAT revenues: an empirical analysis

This section provides the empirical results of our analysis. It first describes the variables in our dataset. Then, it presents the econometric specifications used to analyze the determinants of VAT revenues and their role in explaining VAT compliance.

Our analysis focuses on quarterly VAT revenue data for the period 2002q1-2021q1 with the aim of capturing the short-term dynamics of Covid-19 crisis. The basic specification considers as dependent variable the amount of VAT revenue collected on the goods and services bought and sold for domestic final consumption as reported in the Treasury Single Account (TSA) at the Bank of Italy. The latter does not include the VAT paid by public bodies according to the split payment mechanism<sup>21</sup>; therefore, it represents the VAT paid by households and firms. In order to focus on the effect of endogenous variation of VAT base, revenue data are netted out for policy induced tax changes (i.e. discretionary measures – Appendix). Following the most common approach, we consider private final consumption expenditure as a proxy for the VAT tax base (we include in alternative specifications the related breakdown into goods and services expenditure)<sup>22</sup>. Moreover, as illustrated in the previous sections, we separately identify as explanatory variables: a) the VAT composition effect that arise in response to changes in the composition of consumption basket; b) the value of transactions carried out with cashless instruments as the share of overall consumption expenditure, in order to capture the effect on VAT revenue performance determined by card payments. VAT and household consumption are expressed in nominal terms.

**Table 2: Data sources**

Variables	Source
VAT revenues	TSA at Bank of Italy
Private final consumption expenditure	Istat – quarterly national accounts
POS transactions with cards and on-line	Bank of Italy – supervisory reporting data
Vat composition effect	Own elaboration based on consumption expenditure by durability

<sup>21</sup> Under the split payment mechanism, VAT due by the customer is paid directly to the Tax Authorities rather than to the supplier. This regime applies to the transactions carried out with all Public Administrations, including their controlled companies listed on the Italian stock exchange (Appendix for further details).

<sup>22</sup> Approximately 10 per cent of overall VAT revenue stems from gross fixed capital formation. In line with the most common approach, we exclude the VAT collectable on this expenditure item. In this respect, further analysis would be needed in light of the growing impact of investment on VAT revenue in 2021.

In order to handle seasonality and non-stationarity of the series, all variables are expressed as yearly differences. Moreover, we recur to the logarithmic transformation for final consumption expenditure and VAT revenue; therefore, the related beta coefficients ( $\beta_1$ ) can be interpreted as short-term elasticities<sup>23</sup>.

We model the yearly growth rate of VAT revenue according to the following linear regression models:

$$\text{EQ.1.a} \quad \Delta \log(VAT_t^*) = \beta_1 \Delta \log(Cons_t) + \beta_2 \Delta VAT\_Comp_t + \gamma \Delta Share_{pay_{el}_t} + \varepsilon_t ;$$

$$\text{EQ.1.b} \quad \Delta \log(VAT_t^*) = \beta_1 \Delta \log(Cons_t) + \beta_2 \Delta Share\_serv_t + \gamma \Delta Share_{pay_{el}_t} + \varepsilon_t ;$$

$$\text{EQ.1.c} \quad \Delta \log(VAT_t^*) = \beta_1 \Delta \log(Goods_t) + \beta_2 \Delta \log(Services_t) + \gamma \Delta Share_{pay_{el}_t} + \varepsilon_t ;$$

Where  $\Delta$  denotes variations with respect to the same quarter of the previous year;  $VAT_t^*$  is the actual VAT revenue adjusted for the effects of discretionary measures;  $Cons_t$  is the nominal private consumption expenditure;  $VAT\_Comp_t$  describes the VAT composition effect associated with changes in the share of goods and services with reduced rate (Figure 3) and  $Share_{pay_{el}_t}$  represents the share of final consumption expenditure carried out using cashless instruments.

In the first equation, we do not separately identify the positive effect of a shift in consumers' preferences towards sectors with different propensity to tax evasion, as it could be highly correlated with the VAT composition effect. On this basis, alternative specifications need to be considered jointly in order to properly explain the main drivers of VAT revenue developments (IMF, 2020). With the aim of addressing this problem and analyzing the determinants of VAT compliance, we propose the specifications 2.a and 2.b.

Based on our estimates, VAT revenue elasticities with respect to private consumption is slightly below one. This result could be related to the characteristics of cash data and could be affected by the estimated effect of discretionary measures. However, an elasticity below unity could be the consequence of a lower compliance associated with the most volatile components of consumers' spending: in this case, following a drop in private consumption, expenditure in sectors with higher propensity to tax evasion is expected to fall further causing VAT revenue to decrease less than proportionally<sup>24</sup>. Values close to unity are obtained by explicitly controlling for the share of service expenditure ( $Share\_serv_t$ , equation 1.b)<sup>25</sup>, hinting at higher propensity to VAT evasion in this sector.

The results reported in Table 2 support the hypothesis outlined in the previous sections. As expected, VAT revenue responds not only to changes in the related macroeconomic base but also to variations in the composition of household expenditure, due to different average VAT rate. The size of this effect is captured by the positive and significant coefficient of the variable  $VAT\_Comp_t$  (close to

<sup>23</sup> In empirical literature, tax revenue elasticity estimates usually rely on Error Correction Models, where “long-term elasticity” and “short-term elasticity” are jointly determined (Wolswijk, 2007; Price et al., 2014). For the purpose of this paper, i.e. understanding the determinants of VAT revenue and compliance, estimates are based on log-differenced variables and can be interpreted as short-term elasticities.

<sup>24</sup> In equation 0 (where consumption is the only explanatory variable), the elasticity is below one, in line with the estimates carried out by the Ministry of Finance in the EFD 2020 (Section 1, page 62); this result would be related to the lower VAT rates applied to goods and services that are the most volatile components of the consumption basket.

<sup>25</sup> In the equation 1.b, the variable  $Share\_serv_t$  captures simultaneously the effect on VAT revenue stemming from different rates and compliance heterogeneity among sectors. Therefore, we do not include the variable  $\Delta VAT\_Comp_t$ .

one). Moreover, our estimates suggest that a one-percentage point increase in the share of cashless payments in private consumption results in approximately 0.4 per cent higher VAT revenue owing to increased compliance. As shown below, this key result of our paper is robust to changes in specifications and can be interpreted as a proxy of the propensity to tax evasion associated with cash based transactions<sup>26</sup>.

Equation 1.a assumes implicitly that a shift in consumption patterns affects VAT revenues only through variations in potential VAT ( $VAT\_Comp_t$ ) and modifications of the overall VAT compliance occur entirely via changes in the share of cashless payments. However, as illustrated before, there is evidence of compliance heterogeneity across sectors, which can be estimated by breaking household consumption expenditure into goods and services spending. In this regard, the estimates of equation 1.c show that VAT revenue dynamic is mostly driven by consumption of goods, with an estimated coefficient similar to the one associated with the overall consumption in the specification 1.a. On the contrary, service expenditure seems to play a marginal role in explaining variations in VAT revenue despite it accounts for approximately half of the overall consumer spending. This finding suggests a higher propensity to tax evasion as it could be only marginally explained by differences in the average VAT rates<sup>27</sup>.

For the estimation of the determinants of the VAT compliance, we rely on the following specifications:

$$\text{EQ. 2.a.} \quad -GAP_t = \beta_1 \Delta Goods_t + \beta_2 \Delta Services_t + \gamma \Delta Share\_pay\_el_t + \varepsilon_t$$

$$\text{EQ. 2.b.} \quad -\Delta GAP_t = \beta_1 \Delta Share\_serv_t + \gamma \Delta Share\_pay\_el_t + \varepsilon_t$$

Where the dependent variable  $-\Delta GAP_t$  represents the reduction of the compliance gap as measured in section 3<sup>28</sup>. Equations 2.a and 2.b allow to separately identifying the effects on VAT compliance of cashless transactions and the impact of a shift in consumption patterns towards sectors with higher compliance. Our estimates provide evidence of a negative relationship between service expenditure and compliance<sup>29</sup>; according to the results of equations 2.a. and 2.b, an increase of one-percentage point in the expenditure on services (and a simultaneous reduction in the consumption of goods) results in a reduction of VAT revenue of about 0.4 percentage points<sup>30</sup>.

Overall, our empirical results confirm the intuitions illustrated in section 3 and 4. The coefficient  $\gamma$ , which measures how cashless payments increase tax compliance, is statistically different from zero

<sup>26</sup> The coefficient  $\gamma$  describes the compliance gain associated with cashless payments, as opposed to cash-based transactions. According to our estimates, assuming perfect compliance for cashless transactions – i.e. compliance equal to 1 -the compliance rate associated with cash would be equal to 0.6 per cent. Therefore, a unitary shift from cash towards cashless payments results in 0.4 higher VAT revenue.

<sup>27</sup> Goods are subject to an average VAT rate of almost 18 per cent as opposed to an average rate for services around 7 per cent. Given that consumer spending splits equally between these two categories, assuming the same level of compliance one should expect a similar proportion between the respective elasticities.

<sup>28</sup> In algebraic terms, the compliance change is equal to  $(1 - GAP_t) - (1 - GAP_{t-1}) = -\Delta GAP_t$ .

<sup>29</sup> In equations 2.a. and 2.b  $\Delta Goods_t$  e  $\Delta Services_t$  represents yearly changes while  $\Delta Share\_serv_t$  is the annual difference in the share of services expenditure with respect to overall private consumption expenditure.

<sup>30</sup> According to equation 2.a., a unitary increase in the expenditure for services counter-balanced by an equivalent decrease in the expenditure for goods leads to a decrease in compliance of about 0.42  $(0.22*(-1)+(-0.20)*(+1))=-0.42$ . If we consider the results of equation 2.b, the reduction of VAT compliance stemming from a shift from goods to services is captured by  $-\beta_1$ , i.e. 0.72.

and has a similar magnitude in all equations (its range is between 0.38 and 0.49). Moreover, this result is robust to changes in the model specifications and in the sample considered (estimates based on pre-Covid data provide similar results). However, further analyses would be needed in order to disentangle the relationship between consumption composition and the choice of payment instrument. The estimation of the VAT composition effect and of the related effect on VAT compliance, though consistent with the theory, is partially sensitive to the model specification and sample selection. This issue could be strictly related to the low variability in the explanatory variables throughout the selected sample – and their limited effect on VAT revenue - (as shown in Figure 3).

<b>Table 3: Estimation results</b>						
	Equation 0	Equation 1.a	Equation 1.b	Equation 1.c	Equation 2a.	Equation 2.b
<b>Dependent Variable</b>	$\Delta$ VAT revenue	$\Delta$ VAT revenue	$\Delta$ VAT revenue	$\Delta$ VAT revenue	- $\Delta$ Gap	- $\Delta$ Gap
$\Delta$ Consumption	0.805*** (0.081)	0.867*** (0.072)	0.999*** (0.080)			0.066 (0.0648)
$\Delta$ Expenditure for goods				0.820*** (0.110)	0.224*** (0.055)	
$\Delta$ Expenditure for services				0.137* (0.070)	-0.195*** (0.088)	
$\Delta$ Share of expenditure for services			-1.286*** (0.348)			-0.721** (0.318)
$\Delta$ VAT composition effect		0.971** (0.380)				0.167 (0.332)
$\Delta$ Share of electronic payments		0.378** (0.157)	0.419*** (0.143)	0.431*** (0.139)	0.487*** (0.119)	0.381*** (0.120)
<i>n° of observations:</i>	73	69	69	69	69	69
<i>R-squared:</i>	0.537	0.760	0.782	0.794	0.505	0.582

## 6. VAT revenue vs household consumption: recent trends and future developments

In 2020, household consumption dropped in nominal terms by 11 per cent. At the same time, VAT revenue<sup>31</sup> – once netted out for the effect of tax deferrals that took place in 2020 - contracted by 6 per cent. Therefore, the decline of VAT revenue has been lower than its macroeconomic base by about 5 percentage points.

According to our estimates, this difference can be explained by the following factors:

- A positive VAT composition effect leading to an increase in VAT revenue of almost 1 percentage point;
- A rise in overall VAT compliance – i.e. a decrease of the “compliance gap” – which accounted for about 4 percentage points, as:
  - Consumer preferences shifted towards sectors with higher degree of compliance (2 percentage points)<sup>32</sup>;
  - The share of cashless payments increased (1.5 percentage points)<sup>33</sup>;
  - Government introduced new measures to foster tax compliance (1 percentage point, according to official estimates).

In the first half of 2021, consumption expenditure partially recovered resulting in a yearly nominal growth rate of about 5 per cent. Meanwhile, VAT revenue (netted out the effect of tax deferrals that took place in 2020) increased dramatically by almost 14 per cent, exhibiting a further difference with respect to the related macroeconomic base. With respect to the first half of 2019, VAT outreached pre-pandemic level even though aggregate consumption had still not recovered (-8 per cent with respect to the first half of 2019). This development has been mainly driven by the above-mentioned factors; nevertheless, the rise of private investment<sup>34</sup> may have played a significant role (while its effect was negligible in 2020)<sup>35</sup>.

Concerning the evolution of VAT revenue in the coming quarters, the results of our analysis provide some insights on the expected developments of VAT determinants described above. In particular, for the sake of simplicity, we compare two alternative scenarios:

1. Assuming that there is significant room for growth in the sectors most exposed to the Covid-19 restrictions, the recovery is expected to be driven mostly by services consumption causing VAT revenue to increase less than the aggregate private consumption.
2. On the contrary, supposing that the unleashed pent-up demand will further boost durable goods spending, in the near future VAT will continue to rise more than household

<sup>31</sup> We consider VAT revenue for the period February 2020 – January 2021.

<sup>32</sup> This estimate is based on the observed drop in goods and services consumption (respectively 7 and 16 per cent) and on the size of the coefficients of equations 2.a and 2.b.

<sup>33</sup> In 2020, the share of cashless payments has increased by 4 percentage points (if we consider the second and fourth quarter of 2020 most of the increase is related to e-commerce). In line with our estimates, the greater share of cashless payments in private consumption has raised VAT revenue by 0.4 per cent in light of higher compliance.

<sup>34</sup> See footnote 2.

<sup>35</sup> In the first half of 2021 private investment boomed (+26 per cent over the same period of the previous year); this rise, strongly sustained by fiscal stimulus, is expected to persist in the coming quarters. “The recovery was driven above all by investment. In our surveys, firms indicate that investment conditions have markedly improved and that they expect investment to pick up during the year” (Bank of Italy, 2021).

consumption exceeding significantly pre-crisis levels. In this context, the stock of excess saving accumulated during the pandemic crisis may stimulate consumption expenditure, particularly on durable goods (Bank of Italy, 2021; Guglielminetti and Rondinelli, 2021)<sup>36</sup>.

In broad terms, it is worth highlighting that the positive contribution of the VAT composition effect is expected to unwind in the medium term as restrictions phase out and the consumption of services come back to pre-crisis levels. On the other hand, the VAT compliance increase stemming from the rise in the share of cashless payments may be structural, as the pandemic could have changed permanently consumers' payments attitudes in escalating an already growing trend for cashless transactions.

## 7. Conclusions

We have discussed the main drivers of VAT revenues in the aftermath of Covid-19 crisis and conducted an econometric analysis in order to provide preliminary estimates.

The Covid-19 pandemic has altered consumption behaviour as a direct consequence of the shutdown of large parts of the economy. In particular, consumer spending in services - typically subject to lower VAT rates - dropped massively while durable goods consumption - subject to the highest VAT rate - fell briefly at the onset of the crisis and rose sharply to pre-crisis levels thereafter. The shift in the demand from services towards durable goods led to an increase of the effective VAT rate, which may continue in the coming quarters as consumers could have postponed purchases of durables.

Our analysis provided evidence that, contrary to expectations, overall VAT compliance increased as the most hit sectors are characterized by a lower degree of compliance (leading, in turn, to higher average compliance) and on account of the increase in the share of cashless payments both in physical stores and online.

In the near future, consumption basket is likely to return to pre-crisis composition. On the other hand, the increase in VAT compliance due to a rise in the number of electronic payments may be partly permanent, as the share of cashless payments (and overall VAT compliance) has increased steadily during the last few years.

The results of our econometric analysis are in line with other empirical studies (Immordino et al, 2018; Hondroyiannis et al., 2017, 2020), showing a negative relationship between VAT evasion and electronic payments. Our estimates suggest that, *ceteris paribus*, a one-percentage point increase in the share of cashless payments results in approximately 0.4 percentage points higher VAT revenues through increased compliance; in other terms, the propensity to tax evasion associated with cash based transactions would be around 40 per cent. This result appears to be consistent with the official estimates of VAT gap<sup>37</sup> (25 per cent on average in 2014-2019) despite it requires further investigation<sup>38</sup>.

<sup>36</sup> "A stronger response of consumption to the increase in wealth could be motivated by the desire to make purchases in 2021 that had been postponed owing to the pandemic. As observed in past recessions, it is likely that at least part of the spending on durable and semi-durable goods not made in 2020 was postponed to 2021" (Bank of Italy, 2021).

<sup>37</sup> Istat (2021).

<sup>38</sup> If we assume perfect compliance for cashless transactions, the compliance gap can be obtained by multiplying the share of cash-based transactions (approx. 60 per cent) by the associated propensity to tax evasion (40 per cent). This simple exercise leads to an estimate in line with the official estimates of the VAT gap (25 per cent for the period 2014-2019).



From a wider perspective, the estimated effect of electronic payments on VAT compliance may be affected by some degree of endogeneity in light of the possible correlation between the choice of the payment instrument and the degree of compliance associated with each transaction<sup>39</sup>. Moreover, further analysis would be needed in order to disentangle the relationship between consumption composition and payment attitudes of consumers as the higher propensity to use cashless payments may be an indirect effect of the substitution of durable goods with services. In econometric terms, the presence of collinearity between these exogenous variables may affect estimation accuracy. Sectoral or micro data can help to solve this problem.

Over the last few years, tax authorities have introduced new measures in order to foster cashless payments with the aim of increasing tax compliance (Signorini, 2019)<sup>40</sup>. Our analysis suggests that understanding the determinants of tax compliance is crucial in order to deliver appropriate policy recommendations (Carbó-Valverde and Liñares-Zegarra, 2011). In this respect, a broad not-differentiated incentive to electronic payments is effective only if consumers are able to choose across different payments instrument, regardless the type of good or service they are purchasing<sup>41</sup>. Although the reported results are not yet conclusive, it is possible to argue that the use of electronic payments should be strongly encouraged in sectors with lower degree of compliance.

<sup>39</sup> A consumer may prefer cash transactions to obtain more favourable conditions on the final price, after an explicit agreement with the seller (evasion “with complicity”): the consumer pays less, the seller does not leave any receipt nor pays VAT. By the way, we can argue that these kinds of transactions are not ordinary and limited to specific situations (e.g. service provisions). In most cases evasion takes place “without complicity”: the final price includes (at least partially) VAT, the consumer is free to choose the payment instrument (that is exogenous with respect to the degree of compliance); if consumer pays cash, it will be much more easy for the seller to evade.

<sup>40</sup> Italian Budget Law 2020 (Law n.157/2019) has imposed new limits on cash payments. From 1 July 2020, the limit has been lowered from EUR 3000 to EUR 2000 and from January 2022 it will be lowered again to EUR 1000. Moreover, the Government has introduced other measures to promote the use of non-cash means of payment. In particular, as of July 2020, individuals and enterprises with revenues not exceeding EUR 400.000 are entitled to have a tax credit equal to 30 per cent of the fees charged by payment services providers for the acceptance of electronic payment transactions made by private customers. Moreover, “Promoting the use of non cash-payment instruments [...] is useful also for other reasons. The use of cash entails relevant costs for the production, distribution and storage of banknotes along with higher counterfeiting risks.”

<sup>41</sup> Consider a simple economy with only two types of merchants: A) non-tax evaders, who sell certain kinds of goods and services and accept any payment instrument; B) tax evaders, who accept only cash based payments and sell different -substitutable with those sold by merchant A). A general measure aiming at encouraging cashless payments, irrespective of the relative degree of compliance, would result in an increase of the share of cashless expenditure at merchant A, while payment habits at tax evaders merchants would remain unchanged. Hence, the measure would not increase the overall level of compliance.

## References:

- Aizenman, J., & Jinjarak, Y. (2008). The collection efficiency of the Value Added Tax: Theory and international evidence. *Journal of International Trade and Economic Development*, 17(3), 391-410.
- Allingham, M. G., & Sandmo, A. (1972). Income tax evasion: A theoretical analysis. *Taxation: critical perspectives on the world economy*, 3, 323-338.
- Ardizzi, G., Nobili, A., & Rocco, G. (2020). A game changer in payment habits: evidence from daily data during a pandemic. Bank of Italy – Questioni di Economia e Finanza (591).
- Ardizzi, G., Gambini, A., Nobili, A., Pimpini, E., & Rocco, G. (2021). *L'impatto della pandemia sull'uso degli strumenti di pagamento in Italia* (No. 8). Banca di Italia – Dipartimento Mercati e Sistemi di Pagamento.
- Bank of Italy (2021), Economic Bulletin, 3, 2021.
- Beraja, M., & Wolf, C. K. (2021). *Demand composition and the strength of recoveries*. MIT.
- Brondolo, J. (2009). Collecting taxes during an economic crisis: challenges and policy options. *IMF Staff Position Notes*, 2009(017).
- Carbó-Valverde, S., & Liñares-Zegarra, J. M. (2011). How effective are rewards programs in promoting payment card usage? Empirical evidence. *Journal of Banking & Finance*, 35(12), 3275-3291.
- Carfora, A., Dongiovanni, S., Marabucci, A., & Pisani, S. (2020). The impact of domestic factors and spillovers effects on EU countries VAT gap. *Working paper series*. Agenzia delle Entrate.
- European Commission (2020). Study and Reports on the VAT Gap in the EU-28 Member States.
- D'Agosto, E., & Santoro, A. (2019). The anatomy of VAT efficiency: evidence from Italy 2009-2014. *Agenzia delle Entrate Argomenti di Discussione*, (01).
- De Mello, L. (2009). Avoiding the value added tax: Theory and cross-country evidence. *Public Finance Review*, 37(1), 27-46.
- European Central Bank (2020). Study on the payment attitudes of consumers in euro area (SPACE).
- Esselink, H., & Hernández, L. (2017). The use of cash by households in the euro area. *ECB Occasional Paper*, (201).
- Guglielminetti, E., & Rondinelli, C. (2021). Consumption and saving patterns in Italy during Covid-19. Banca d'Italia – *Questioni di Economia e Finanza*, (620).
- Hondroyiannis, G., & Papaoikonomou, D. (2017). The effect of card payments on VAT revenue: New evidence from Greece. *Economics Letters*, 157, 17-20.
- Hondroyiannis, G., & Papaoikonomou, D. (2020). The effect of card payments on VAT revenue in the euro area: evidence from a panel VECM. *Journal of Economic Studies*.
- Hutton, M. E. (2017). *The Revenue Administration–Gap Analysis Program: Model and Methodology for Value-Added Tax Gap Estimation*. International Monetary Fund.
- IMF Fiscal Affairs (2020). Special Series on Fiscal Policies to Respond to Covid-19. *Challenges in Forecasting Tax Revenue*.

- Immordino, G., & Russo, F. F. (2018). Cashless payments and tax evasion. *European Journal of Political Economy*, 55, 36-43.
- Istat (2020). L'economia non osservata nei conti nazionali 2015-2018.
- Istat (2021). Relazione sull'economia non osservata e sull'evasione fiscale e contributiva - anno 2021.
- Mourre, G., & Princen, S. (2015). Tax revenue elasticities corrected for policy changes in the EU (No. 5657). *CESifo Working Paper*.
- MEF (2020). Relazione sull'economia non osservata e sull'evasione fiscale e contributiva – Anno 2020.
- Price, R., Dang, T. T., & Guillemette, Y. (2014). New tax and expenditure elasticity estimates for EU budget surveillance. OECD, *Working Paper series*.
- Poghosyan, T. (2011). Assessing the variability of tax elasticities in Lithuania. *IMF working paper*.
- Rocco, G. (2019). The Use of Cash in Italy: Evidence from the ECB Study on the Use of Cash by Households. Bank of Italy. *Questioni di Economia e Finanza*, (481).
- Sancak, M. C., Velloso, R., & Xing, J. (2010). Tax revenue response to the business cycle. *International Monetary Fund*.
- Simon H., & Harding M. (2020). What drives consumption tax revenues? Disentangling policy and macroeconomic drivers. *OECD Taxation working papers* n.47.
- Signorini, L. F. (2019). Audizione preliminare all'esame della manovra economica per il triennio 2020-2022.
- Szczypińska, A. (2019). What drives the VAT gap in the European Union? *Collegium of Economic Analysis Annals*, (55), 69-82.
- Tauber K. & Van Zandweghe W. (2021). Why has durable goods spending been so strong during the Covid-19 Pandemic? *Economic Commentary, Research Department*. Federal Reserve Bank of Cleveland.
- Ueda, M. J. (2017). The evolution of potential VAT revenues and C-efficiency in advanced economies. *International Monetary Fund*.
- Wolswijk, G. (2007). Short-and long-run tax elasticities: the case of the Netherlands. *ECB working paper series* (763 – June 2007)

## APPENDIX

### Description of data used in figures and models:

- **VAT revenue**

VAT revenue data are retrieved from the Bank of Italy Treasury Single Account database. In particular, we considered periodic VAT payments sent via F24 form and does not include VAT paid by Public Administrations. By the 16th day of each month, most taxpayers must calculate the difference between their output VAT – i.e. VAT on sales made – and input VAT – i.e. VAT on purchases, which they intend to reclaim – in the previous months. Taxpayers with an annual turnover of less than EUR 400 000 for supplies of services or EUR 700 000 for other activities, or belonging to can choose to submit quarterly VAT returns.

Additionally, by 27 December of each year, all taxpayers must pay an advance:

- on their VAT bill for the month of December if they file monthly VAT returns or
- on their VAT bill for the fourth quarter if they file quarterly VAT returns

With the aim of isolating the impact of endogenous changes in the tax bases on revenue, VAT data are netted out of the policy-induced tax changes. In particular, we have considered the effects of the following legislative changes:

#### 1) **Changes of the standard VAT rate**

In the period from 2002 to 2021, the standard VAT rate has increased from 20 per cent to 22 per cent following the approval of the Law Decree n.138 in 2011 and of the Law Decree n.76 in 2013. The related effects on VAT revenues are obtained from the variation of potential VAT revenues and of the average compliance rate. Our estimate suggests that an increase of one-percentage point in the statutory VAT rate results in almost one billion higher tax revenues as the legislative changes have affected mainly durable goods (which represents almost 16 per cent of overall households expenditure)<sup>42</sup>.

#### 2) **Split payment system**

2015, the new split payment system came into force for supplies of goods and services made to public bodies with the purpose of reducing VAT gap by fighting tax evasion and fraud. Under the split payment system, VAT payable by the customer is paid directly to the Tax Authorities rather than to the supplier. Hence, Public bodies “split” the payment of the invoice: they pay the taxable amount to the supplier and the VAT directly to the TSA. As of 2017, in light of the effectiveness of such mechanism in fighting tax evasion, Italian government has expanded the measure’s scope of the split payment to all services subject to withholding tax and to transactions carried out with all Public Administrations, including their subsidiaries and companies listed on the Italian stock exchange. The introduction of the split payment mechanism was estimated to increase net VAT revenue by almost one billion each year. However, by looking at the monthly cash data, the ex post effect on VAT revenue has been significantly larger mostly on account of the greater stock of VAT credits. Therefore, we removed the impact of split payment

<sup>42</sup> This estimate is significantly lower than the effects embedded in the official Government Reports. Further studies are underway to examine the determinants of this discrepancy.

system by adjusting the VAT revenue series by almost 3 billion over the selected sample. These estimates are in line with Italian Treasury's evaluations illustrated in the annual report on tax evasion.

### 3) Eletronic invoice system

From 1 January 2019 it has become mandatory to issue an electronic invoice following the sale of goods and rendering of services for transactions between private individuals carried out between subjects residing or established in Italy. From 1<sup>st</sup> July 2019, the obligation to issue an electronic receipt comes into force for subjects conducting retail trade and similar activities with a turnover exceeding 400,000 euros and that, currently, are not obliged to issue an invoice to customers, unless the document is requested by the customer; for all others the obligation started from 1<sup>st</sup> January 2020.

- **Final consumption expenditure**

In line with the literature, we use nominal seasonally adjusted quarterly data on private consumption expenditure as a proxy for VAT tax base. Final consumption data are retrieved from the Istat database.

- **Cashless payments**

The amount of cashless payments made at points of sales and on-line are retrieved from the supervisory reporting database of the Bank of Italy. Values are then expressed as a share of nominal private consumption expenditure.

- **Compliance gap**

The compliance gap ( $GAP_t$ ) is calculated as the difference between the potential VAT revenue ( $VAT_{pot_t}$ ) and the actual VAT revenue ( $VAT_t$ ) under current legislation as follows:

$$GAP_t = \frac{VAT_{pot_t} - VAT_t}{VAT_{pot_t}}$$

Where  $VAT_{pot_t}$  is defined as the amount of VAT that would be collected in absence of fraud:

$$VAT_{pot_t} = \sum_{i=n}^N \left( \frac{cons_{t,i} * \alpha_i}{1 - \alpha_i} \right) + \sum_{i=n}^N \left( \frac{inv_{t,i} * \alpha_i}{1 - \alpha_i} \right) * propex_i + \sum_{i=n}^N \left( \frac{cons_{int_{t,i}} * \alpha_i}{1 - \alpha_i} \right) * propex_i$$

Where  $cons_{t,i}$  represents the national final consumption expenditure,  $inv_{t,i}$  the gross fixed capital formation and  $cons_{int_{t,i}}$  the intermediate consumption expenditure. The propex is defined as the percentage of output in a given sector that is exempt from VAT.

**Simplified approach for the estimation of VAT compliance gap:**

The simplified approach proposed in this work for the estimation of the potential VAT revenue relies on the annual household consumption data broken down by the Individual Consumption according to Purpose (Coicop). By applying to each subgroup listed in Table A.3 the statutory VAT rate, we compute the potential VAT revenue. In order to estimate the amount of VAT collectable on the other GDP components (i.e. intermediate consumption, gross fixed capital formation and government final consumption expenditure), we use the statutory VAT rates for each component and the related propex. The latter identifies the percentage of output in a given sector that is exempt from VAT. The estimates made according to this simplified approach are in line with those published by the European Commission for the period 2014 to 2019. In Tables A.1. and A.2 are summarized our results as compared with the European Commission estimates.

• **Policy gap**

The policy gap represents the effects of applying exemptions on the standard rate and, therefore, is a measure of the additional VAT revenue that could be levied if a constant VAT rate were applied to all goods and services. It can be expressed as follows:

$$Policy\_gap_t = \frac{VAT_{pot\_ref_t} - VAT_{pot_t}}{VAT_{pot\_rif_t}}$$

**Illustration of the policy gap effect on VAT revenue:**

The previous equation shows that the computation of the policy gap relies on the estimation of VAT revenue under the hypothesis of a single rate applied to all final consumption expenditure. However, this measure represents a pure theoretical value since it does not contemplate differentiated rates and exemptions; hence, it cannot be directly related to the actual VAT revenue. Therefore, in order to estimate the VAT composition effect we consider the effects on VAT revenue related exclusively to variations in consumption behavior assuming invariance in the statutory VAT rates. Furthermore, we need to multiply the policy gap change ( $\Delta Policy\_gap_t$ ) by a scale factor in order to express the variation in terms of potential VAT:

$$Policy\_gap_t = \frac{VAT_{pot\_rif_t} - VAT_{pot_t}}{VAT_{pot\_ref_t}}, \quad Policy\_gap^*_t = \frac{VAT_{pot\_rif_t} - VAT_{pot_t}^*}{VAT_{pot\_ref_t}}$$

$$\Delta Policy\_gap_t = (Policy\_gap^*_t - Policy\_gap_t)$$

$$\Delta VAT\_Comp_t = -\Delta Policy\_gap_t * \frac{VAT_{pot\_ref_t}}{VAT_{pot_t}} = \frac{VAT_{pot_t} - VAT_{pot_t}^*}{VAT_{pot_t}}$$

Where  $VAT_{pot_t}$  represents the potential VAT revenue under the current policy framework using the observed composition of goods and services while  $VAT_{pot_t}^*$  expresses the potential VAT collection assuming invariance of consumers' preferences – i.e. all final consumption expenditure components vary with the same annual growth rate. The latter can be obtained by multiplying each household spending's component by the yearly growth rate of private consumption and by the related VAT rate.

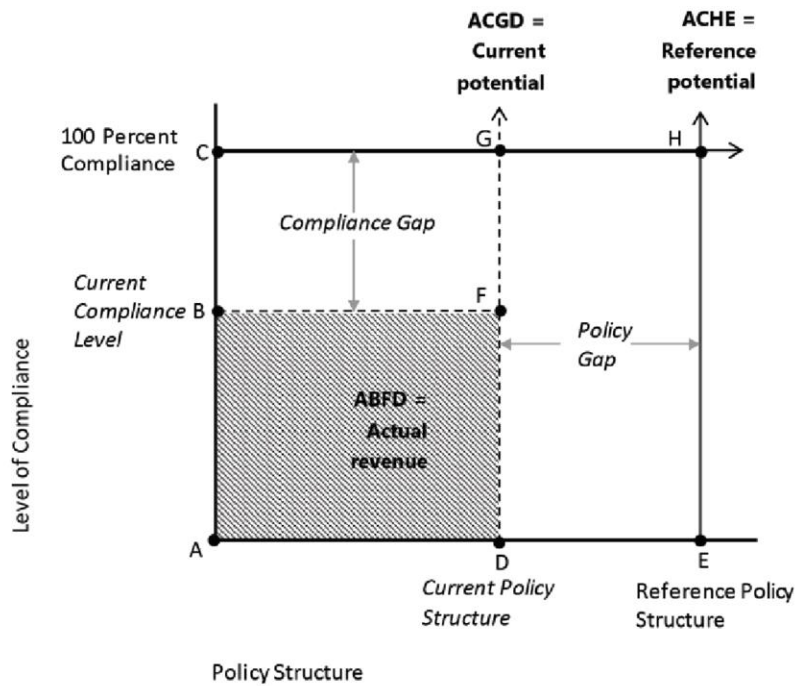
- VAT gap

$$GAP_{tot_t} = 1 - \frac{VAT_t}{VAT_{pot_{ref_t}}} = \left(1 - \frac{VAT_t}{VAT_{pot_t}}\right) * \left(1 - \frac{VAT_{pot_t}}{VAT_{pot_{ref_t}}}\right)$$

Where  $\frac{VAT_t}{VAT_{pot_{ref_t}}}$  represents the “C-efficiency ratio”, which can be decomposed as follows:

$$\frac{VAT_t}{VAT_{pot_{ref_t}}} = \left(\frac{VAT_t}{VAT_{pot_t}}\right) * \left(\frac{VAT_{pot_t}}{VAT_{pot_{ref_t}}}\right)$$

**Figure A.1: Illustration of the Components of the VAT GAP:**



**Source:** Hutton, M. E. (2017).



**Table A.1: potential VAT revenue and *Compliance gap***  
(own calculations)

	2014	2015	2016	2017	2018	2019	2020
<b>VAT potential revenue</b>	<b>134.051</b>	<b>135.906</b>	<b>137.434</b>	<b>142.171</b>	<b>145.653</b>	<b>146.315</b>	<b>126.795</b>
<i>o/w: potential VAT on household final consumption</i> <sup>(1)</sup>	95.144	97.037	98.256	101.213	103.384	103.851	88.218
<i>o/W: potential VAT on intermediate consumption</i> <sup>(2)</sup>	20.872	20.953	20.671	21.752	22.420	22.364	19.682
<i>o/w: potential VAT on government and NPISH final consumption</i> <sup>(2)</sup>	2.183	2.171	2.212	2.244	2.297	2.301	2.357
<i>o/w: potential VAT on GFCF</i> <sup>(2)</sup>	12.170	12.537	13.022	13.576	14.141	14.387	13.126
<i>di cui: net adjustments</i> <sup>(3)</sup>	3.682	3.208	3.272	3.385	3.412	3.412	3.412
<b>VAT Revenue (accrual)</b>	<b>96.567</b>	<b>100.345</b>	<b>102.086</b>	<b>107.576</b>	<b>109.333</b>	<b>111.464</b>	<b>99.808</b>
<b>VAT GAP</b>	<b>37.484</b>	<b>35.561</b>	<b>35.348</b>	<b>34.595</b>	<b>36.320</b>	<b>34.851</b>	<b>26.987</b>
<b>VAT GAP %</b>	<b>28,0%</b>	<b>26,2%</b>	<b>25,7%</b>	<b>24,3%</b>	<b>24,9%</b>	<b>23,8%</b>	<b>21,3%</b>

1) The potential VAT revenue is calculated using the annual household consumption data in accordance with the Classification of Individual Consumption according to Purpose and the related statutory VAT rates.

2) The estimates of the potential VAT for these components take into account the percentage of output that is exempt from VAT (propex). If the propex for sector “i” equals 1, for instance, all the output of that sector is exempt from VAT, and consequently the sector is unable to recover the VAT paid on its inputs.

3) Residual component. 2019 and 2020 values are set equal to 2018 in absence of information.

**Table A.2: potential VAT and *Compliance gap***  
(European Commission estimates)

	2014	2015	2016	2017	2018	2019	2020
<b>VAT potential revenue</b>	<b>137.817</b>	<b>139.703</b>	<b>140.400</b>	<b>142.939</b>	<b>144.772</b>	<b>146.855</b>	
<i>o/w: potential VAT on household final consumption</i> <sup>(1)</sup>	97.232	99.621	99.890	100.918	102.246		
<i>o/W: potential VAT on intermediate consumption</i> <sup>(2)</sup>	21.543	21.350	21.086	22.350	22.440		
<i>o/w: potential VAT on government and NPISH final consumption</i> <sup>(2)</sup>	2.054	2.207	2.269	2.281	2.308		
<i>o/w: potential VAT on GFCF</i> <sup>(2)</sup>	13.305	13.318	13.883	14.005	14.366		
<i>di cui: net adjustments</i> <sup>(3)</sup>	3.682	3.208	3.272	3.385	3.412		
<b>VAT Revenue (accrual)</b>	<b>96.567</b>	<b>100.345</b>	<b>102.086</b>	<b>107.576</b>	<b>109.333</b>	<b>111.793</b>	
<b>VAT GAP</b>	<b>41.250</b>	<b>39.358</b>	<b>38.314</b>	<b>35.363</b>	<b>35.439</b>		
<b>VAT GAP %</b>	<b>29,9%</b>	<b>28,2%</b>	<b>27,3%</b>	<b>24,7%</b>	<b>24,5%</b>	<b>23,9%</b>	<b>29,4%</b>

The EC Study contains Value Added Tax (VAT) Gap estimates up to 2018 and fast estimates using a simplified methodology for 2019. For 2020, European Commission estimates are based on econometric analysis to forecast potential impacts of the coronavirus crisis and resulting recession on the evolution of the VAT Gap in 2020 is reported.

**Table A.3: Statutory rates and consumption by coicop classification**

Expenditure by purpose (coicop/cofog)	Durability	2012	2013	2014	2015	2016	2017	2018	2019	Statutory Rates*
<b>food and non-alcoholic beverages</b>		<b>142.371</b>	<b>142.228</b>	<b>141.902</b>	<b>144.897</b>	<b>146.682</b>	<b>151.156</b>	<b>153.183</b>	<b>155.023</b>	
<b>food</b>		<b>131.352</b>	<b>131.400</b>	<b>131.050</b>	<b>133.723</b>	<b>135.159</b>	<b>139.049</b>	<b>140.804</b>	<b>142.486</b>	
bread and cereals	non-durables	24.370	24.443	24.501	24.909	25.234	26.126	26.284	26.572	4%
meat	non-durables	32.962	32.813	32.812	33.060	32.443	33.141	33.763	34.208	10%
fish and seafood	non-durables	10.425	9.903	10.186	10.695	11.244	11.581	11.751	11.934	10%
milk, cheese and eggs	non-durables	19.265	19.315	19.256	19.423	19.254	19.617	19.798	20.069	7%
oils and fats	non-durables	4.753	4.671	4.579	4.903	5.100	5.432	5.459	5.497	4%
fruit	non-durables	12.075	12.424	12.179	12.618	13.028	13.359	13.636	13.767	4%
vegetables	non-durables	18.615	19.013	18.638	19.015	19.471	20.059	20.271	20.485	4%
sugar, jam, honey, chocolate and confectionery	non-durables	6.143	6.137	6.184	6.323	6.480	6.785	6.907	6.983	10%
food products n.e.c.	non-durables	2.745	2.682	2.716	2.776	2.905	2.951	2.936	2.971	15%
<b>non-alcoholic beverages</b>		<b>11.019</b>	<b>10.828</b>	<b>10.852</b>	<b>11.174</b>	<b>11.523</b>	<b>12.107</b>	<b>12.379</b>	<b>12.537</b>	
coffee, tea and cocoa	non-durables	4.038	3.915	3.992	4.087	4.287	4.554	4.687	4.761	10%
mineral water, soft drinks and vegetable juices	non-durables	6.981	6.913	6.860	7.087	7.236	7.553	7.692	7.776	22%
<b>alcoholic beverages, tobacco and narcotics</b>		<b>43.042</b>	<b>42.395</b>	<b>40.756</b>	<b>42.203</b>	<b>43.472</b>	<b>44.389</b>	<b>44.934</b>	<b>45.457</b>	
alcoholic beverages	non-durables	9.393	9.376	9.359	9.638	9.742	9.990	10.028	10.124	22%
tobacco and narcotics	non-durables	33.649	33.020	31.397	32.565	33.731	34.399	34.907	35.334	22%
<b>clothing and footwear</b>		<b>61.831</b>	<b>60.490</b>	<b>61.524</b>	<b>62.630</b>	<b>62.974</b>	<b>64.171</b>	<b>66.409</b>	<b>63.946</b>	
clothing	semi-durables	50.507	49.246	49.614	50.575	50.908	51.904	53.942	51.849	22%
footwear	semi-durables	11.324	11.245	11.910	12.056	12.066	12.267	12.468	12.097	22%
<b>housing, water, electricity, gas and other fuels</b>		<b>231.566</b>	<b>234.828</b>	<b>232.225</b>	<b>235.796</b>	<b>235.733</b>	<b>238.805</b>	<b>242.411</b>	<b>244.459</b>	
actual rentals for housing	services	21.927	22.243	22.618	22.769	22.874	23.071	23.431	23.700	0%
imputed rentals for housing	services	140.335	143.050	144.456	146.471	148.242	149.965	152.228	153.773	0%
maintenance and repair of the dwelling	semi-durables	7.711	7.395	7.387	7.478	7.925	7.922	7.517	7.579	18%
water supply and miscellaneous services relating to the dwelling	non-durables	19.471	20.438	20.604	20.891	21.253	22.052	22.615	22.854	10%
electricity, gas and other fuels	non-durables	42.122	41.704	37.160	38.188	35.439	35.795	36.621	36.554	10%
<b>furnishings, household equipment and routine household maintenance</b>		<b>63.448</b>	<b>61.527</b>	<b>61.804</b>	<b>62.918</b>	<b>63.926</b>	<b>64.860</b>	<b>66.411</b>	<b>66.699</b>	<b>18%</b>

furniture and furnishings, carpets and other floor coverings including repairs	durables	22.007	20.487	20.700	21.662	22.150	22.585	23.867	24.375	22%
household textiles	semi-durables	2.935	2.669	2.582	2.700	2.880	2.956	3.153	3.115	10%
major household appliances including repairs	durables	4.890	4.928	5.013	5.075	5.302	5.566	5.657	5.749	22%
small electric household appliances including repairs	semi-durables	1.247	1.294	1.320	1.383	1.463	1.478	1.438	1.426	22%
glassware, tableware and household utensils	durables	4.465	3.900	4.088	3.928	4.097	4.230	4.153	4.114	22%
tools and equipment for house and garden	semi-durables	2.231	2.277	2.297	2.263	2.337	2.480	2.442	2.424	22%
non-durable household goods	non-durables	9.535	9.321	9.198	9.405	9.619	9.827	9.904	9.906	22%
domestic services and household services	services	16.138	16.652	16.607	16.501	16.079	15.738	15.798	15.591	22%
<b>health</b>		<b>32.950</b>	<b>32.899</b>	<b>33.918</b>	<b>35.807</b>	<b>35.911</b>	<b>37.341</b>	<b>37.922</b>	<b>38.148</b>	<b>10%</b>
medical products, appliances and equipment	non-durables	12.602	12.705	12.646	13.023	12.947	13.474	13.945	14.297	15%
out-patient services	services	15.149	14.951	15.969	17.465	17.543	18.290	18.370	18.252	0%
hospital services	services	5.199	5.243	5.304	5.319	5.420	5.577	5.607	5.598	0%
<b>transport</b>		<b>127.139</b>	<b>122.380</b>	<b>123.898</b>	<b>124.728</b>	<b>127.086</b>	<b>133.105</b>	<b>139.244</b>	<b>140.484</b>	<b>10%</b>
purchase of vehicles	durables	24.154	22.532	23.176	26.791	30.402	33.204	34.613	34.971	20%
operation of personal transport equipment (excluding fuels)	services	37.177	36.206	37.024	38.781	39.837	40.918	41.627	42.502	22%
fuels and lubricants for personal transport equipment	non-durables	49.064	46.648	46.058	40.842	37.617	38.650	42.332	41.835	22%
transport services	services	16.744	16.994	17.640	18.315	19.230	20.333	20.671	21.176	7%
<b>communications</b>		<b>27.781</b>	<b>25.797</b>	<b>24.131</b>	<b>24.553</b>	<b>24.559</b>	<b>25.266</b>	<b>24.400</b>	<b>23.736</b>	<b>22%</b>
postal services	services	716	653	608	612	604	600	580	561	11%
telephone and telefax equipment	services	6.011	5.995	5.902	6.486	6.649	7.134	7.182	7.330	22%
telephone and telefax services	services	21.055	19.149	17.621	17.455	17.307	17.531	16.638	15.845	22%
<b>recreation and culture</b>		<b>68.683</b>	<b>64.113</b>	<b>64.792</b>	<b>67.273</b>	<b>69.324</b>	<b>70.888</b>	<b>72.024</b>	<b>73.427</b>	<b>10%</b>
audio-visual, photographic and information processing equipment	durables	8.080	7.364	7.472	7.544	7.681	8.260	8.375	8.500	22%
other major durables for recreation and culture	services	2.901	2.678	2.569	2.755	2.719	2.816	2.950	2.971	10%
games, toys and hobbies; equipment for sport, camping and open-air recreation	services	5.305	4.984	4.916	5.320	5.528	5.595	5.778	5.746	22%
gardens, plants and flowers; pets and related products; veterinary and other services for pets	services	8.932	8.022	8.280	8.400	8.484	8.857	9.217	9.306	10%
recreational and cultural services	services	27.961	26.638	26.719	27.785	29.145	29.438	29.672	30.621	13%
books	semi-durables	3.414	3.113	3.038	3.251	3.348	3.385	3.481	3.530	4%
newspapers and periodicals; miscellaneous printed matter; stationery and drawing materials	non-durables	6.373	5.790	5.773	5.855	5.694	5.695	5.637	5.625	4%

package holidays	services	5.716	5.525	6.025	6.363	6.725	6.841	6.915	7.128	22%
<b>education</b>	<b>services</b>	<b>10.029</b>	<b>9.860</b>	<b>9.878</b>	<b>10.036</b>	<b>10.380</b>	<b>10.166</b>	<b>9.846</b>	<b>9.920</b>	<b>0%</b>
<b>restaurants and hotels</b>		<b>95.714</b>	<b>95.794</b>	<b>97.684</b>	<b>101.310</b>	<b>103.806</b>	<b>108.539</b>	<b>110.622</b>	<b>112.733</b>	
catering services	services	73.150	73.408	75.020	77.172	79.232	82.274	83.584	85.008	8%
accommodation services	services	22.565	22.386	22.664	24.138	24.574	26.266	27.039	27.725	10%
<b>miscellaneous goods and services</b>		<b>98.491</b>	<b>98.287</b>	<b>101.846</b>	<b>103.277</b>	<b>105.491</b>	<b>107.811</b>	<b>110.337</b>	<b>113.229</b>	
personal care	services	25.133	24.530	24.824	25.311	25.665	26.413			
hairdressing salons and personal grooming establishments and other services for personal care	durables	13.520	13.353	13.748	13.930	14.348	14.651	14.872	15.321	22%
electrical appliances for personal care; other appliances, articles and products for personal care	services	11.613	11.177	11.076	11.381	11.317	11.762	11.330	11.398	22%
prostitution; other services n.e.c.	semi-durables	20.543	19.995	20.213	20.683	21.130	21.930	22.765	23.322	0%
personal effects n.e.c.	services	10.415	9.743	10.220	11.180	11.262	11.770	11.911	11.789	22%
social protection	services	6.922	6.923	6.936	6.928	7.130	7.145	7.369	7.508	0%
insurance	services	17.862	19.272	19.715	20.457	21.815	21.433	23.685	24.390	0%
financial services n.e.c.	services	17.617	17.824	19.938	18.718	18.489	19.120	18.404	19.501	10%
<b>total households consumptions</b>		<b>1.003.045</b>	<b>990.599</b>	<b>994.358</b>	<b>1.015.428</b>	<b>1.029.343</b>	<b>1.056.495</b>	<b>1.077.745</b>	<b>1.087.259</b>	

		2012	2013	2014	2015	2016	2017	2018	2019	Average rates (2019)
	durables	75209	70388	71525	76381	80948	85608	87995	89107	21,2%
	semi-durables	89784	86981	88368	90886	92188	94161	96351	93809	20,6%
	non-durables	324580	321228	314096	315304	312723	321037	329171	331551	11,9%
	services	513472	512003	520369	532857	543483	555689	564228	572793	6,9%
<b>Private final consumption expenditure by durability</b>		<b>1.003.045</b>	<b>990.600</b>	<b>994.358</b>	<b>1.015.428</b>	<b>1.029.343</b>	<b>1.056.495</b>	<b>1.077.745</b>	<b>1.087.259</b>	<b>11,2%</b>
<b>Total</b>		<b>1.003.045</b>	<b>990.600</b>	<b>994.358</b>	<b>1.015.428</b>	<b>1.029.343</b>	<b>1.056.495</b>	<b>1.077.745</b>	<b>1.087.259</b>	<b>11,2%</b>

\* In case of multiple VAT rates within the same category an average VAT rate is considered.