

Real-Time Invoice Data to Enforce VAT Outcomes: Designing an EU-Compatible Data Reconciliation Procedure (DRP) for the ViDA Era

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Abstract

EU VAT is largely built on self-assessment: taxpayers aggregate output VAT and deductible input VAT in a periodic VAT return and settle the balance. As transaction-level invoice reporting matures, tax administrations can compute return fields from invoice databases and detect arithmetic deviations at scale. However, the main enforcement tool is the good old tax audit, which is still a human resource-intensive process. This creates a credibility gap when all discrepancies are systematically revealed but consequences are left unaddressed, giving advantage to the unreliable taxpayer.

This article describes the existing “VAT borrowing” problem (pure false figures and timing arbitrage in cancellations, credit notes, and deduction timing), and presents a detailed solution: *DRP*, an automated reconciliation and assessment procedure that preserves the principle of self-declaration, while making obvious machine-proven arithmetic differences enforceable with due-process safeguards. The proposal is compatible with VAT in the Digital Age reforms and the amended framework of the VAT directive. [2, 3, 4]

1 Introduction

1.1 Why is the problem so acute now?

VAT compliance historically relied on the taxpayer’s periodic return, with tax audits used to validate and correct. Transaction-level invoice reporting changes that assumption: tax administrations can now compute (or tightly bound) the VAT position from invoice-level data and cross-check it against the return.

Spain’s SII (Suministro Inmediato de Información) is a prominent near-real-time example: covered taxpayers must transmit invoice record details within a short statutory window (generally four days), the system enables cross-checking with counterparty information, and certain periodic/annual informational filings are removed for SII taxpayers.[5] Hungary’s online invoice reporting system collects invoice data on row level from all electronic invoicing systems in real-time.

Most experts see these data as an additional tool for selecting for a tax audit. This approach has proven to be *flawed on a large scale*. As digital reporting expands, discrepancies that were previously hidden within aggregates become visible. The practical policy question becomes:

- How should tax administrations *correct* and *occasionally sanction* systematic arithmetic/timing deviations *without* turning everything into a full audit? (...when *none of the tax administrations of the EU* has the resources to initiate tax audit even at one percent of the economic entities after each VAT return period, but more than this ratio is affected by arithmetic errors.)
- Do existing EU legal and procedural tools suffice, or is a targeted refinement needed to make data-driven corrections *enforceable at scale*?

1.2 ViDA context

The VAT in the Digital Age (ViDA) package was adopted in spring 2025. It amends the VAT Directive via Council Directive 2025/516. ViDA introduces a harmonised direction for digital reporting and e-invoicing, including cross-border reporting rules and alignment of national systems over a multi-year rollout.

2 The compliance issue

2.1 The “brute force” method to delay VAT payment

Some taxpayers occasionally resort to a manifestly unlawful practice by declaring, in the relevant line of the VAT return, an amount of VAT that is lower than the VAT content of the invoices issued and cash-register receipts generated during the return period. This is particularly pronounced where invoices have not been settled by customers or where the business faces liquidity constraints. In such cases, the resulting VAT shortfall is rolled forward for months and is subsequently corrected by way of a self-revision return once liquidity improves or once the taxpayer receives an (electronic) notice from the tax authority, which they suspect is a tax audit notification. The latter is important because the legal presumption of delivery for such electronic notices takes effect only upon opening the message, and the taxpayer intentionally postpones opening the notice until after the self-revision has been filed. In such cases, the ensuing audit procedure will not reveal any irregularity if the taxpayer has remedied the error through a self-revision return and has paid the corresponding late-payment interest, thus consuming scarce audit capacity with little or no compliance yield.

In the remainder of this article, VAT arbitrage based on canceled invoices is used as an illustrative example; however, the same considerations apply equally to VAT returns submitted with false data in the manner described here.

2.2 “VAT borrowing” through timing arbitrage

Under Council Directive 2006/112/EC (VAT Directive), taxpayers generally determine VAT due through periodic reporting based on taxable transactions and the right to deduct input VAT (subject to conditions). In practice, this allows cash-flow optimisation opportunities when the system tolerates period-to-period asymmetries.

2.2.1 The mechanics of timing arbitrage

A common pattern visible in transaction-level invoice data is:

1. **Output-side acceleration of reductions:** taxpayers reflect cancellations/credit notes in an earlier (probably the earliest possible) period to reduce payable VAT.

2. Input-side deferral of reductions (or acceleration of deductions): taxpayers delay reflecting suppliers’ cancellations/credit notes to maximise current-period deductions.

Even if amounts are net out over time, the time shift yields a financing advantage: the taxpayer effectively “borrows” from the Treasury.

2.3 Why “letter-only” reconciliation fails at scale

If a tax administration merely notifies the discrepancy (e.g., via a reconciliation letter in Hungary) but cannot impose a “default legal outcome” in the absence of a full audit, rational taxpayers who benefit from the timing advantage can ignore the notice. Over time, the perception of the taxpayers will be that

- the tax administration can detect the pattern, but
- correction is not enforceable on a scale unless audit capacity is expanded dramatically (which is far from reality).

3 What do transaction-level systems look like internationally

Operational models typically fall into two families:

- **Near-real-time invoice data reporting:** the business issues invoices and transmits invoice record data quickly to the tax authority (e.g., Spain SII).[5]
- **E-invoicing and authorisation models:** the invoice is validated/authorised through a platform workflow (often before it is treated as fully effective for VAT and commercial purposes).

3.1 Near-real-time reporting examples

Spain (SII). The Spanish Tax Agency describes SII as VAT management based on electronic supply of invoicing records, with the general requirement to transmit invoicing record detail within four days. The administration also highlights the capabilities of counterparty cross-checking.

Hungary (Real-Time Invoice Reporting (OSA) and eVAT systems). All invoices created by an electronic app, service, or cash register are automatically reported to the OSA system. Handwritten invoices must be reported within one or four days, depending on the amount of VAT content. Both the issuer and the recipient of the invoice can download the data or even complete and submit the VAT return in the (optional) eVAT service, which has web and machine-to-machine interfaces. NAV (tax and customs administration of Hungary) prepares the draft VAT return which is available to amend and submit in the eVAT service. NAV performs the arithmetic analysis of VAT returns in each period, considering the deductible VAT of invoices back to a maximum of five years.[6, 7]

3.2 Central invoicing platform examples

Italy (SdI). Italy uses the Sistema di Interscambio (SdI) to manage electronic invoices and perform formal checks before sending them.[8] According to the mandatory Italian e-invoicing rules, invoices issued outside of SdI when SdI transmission is required (e.g., paper/PDF invoices) are not valid for VAT purposes and may be treated as not issued.[9]

Italy also moved toward precompiled VAT compliance artefacts: draft VAT registers and periodic settlement communications (LIPE models) can be prepared using transactional data (including SdI e-invoices), with taxpayers able to review and amend drafts before confirmation.[10]

Poland (KSeF). Poland is implementing a central e-invoicing platform (KSeF). The European Commission’s 2025 eInvoicing Country Factsheet notes the plan to make e-invoicing mandatory for commercial transactions starting 1 February 2026. The implementation is expected to follow a phased approach [11].

Romania (e-TVA). Romania’s RO e-TVA introduces a pre-filled VAT return (Form D300) compiled by ANAF from multiple digital data sources (e.g., RO e-Invoice and other reported datasets), providing taxpayers with a transaction-based benchmark to validate their self-declared return. The system creates a new control opportunity: ANAF can automatically compare the taxpayer-filed D300 with the pre-filled position and flag “significant differences”. If such differences are detected, the framework creates an electronic ‘RO e-TVA compliance notice’ requiring the taxpayer to submit explanations and/or corrections within 20 days. Failure to respond (or respond adequately) can trigger graduated administrative fines. Full enforcement has been postponed for specific taxpayer categories until 30 September 2026—illustrating that data capability can outpace operational/legal rollout. [12].

3.3 Non-EU models relevant for scalable enforcement

Chile (SII): buyer acknowledgment and proposal-based compliance. In Chile’s e-invoicing regime, recipients are expected to generate an acknowledgment of receipt; if they do not, the invoice is considered formally accepted after a period of eight days.[13]

Chile also provides an electronic purchase and sales register (Registro de Compras y Ventas, RCV) and a draft monthly VAT return (Propuesta de IVA) for taxpayer review, based on transaction-level data.

4 ViDA: detection becomes universal

4.1 ViDA adoption

The Council adopted the ViDA package in spring 2025.[3] The Commission confirms the progressive rollout of the package until 2035 and provides links to the core legal acts.[4] The core amendments to the VAT Directive are in Council Directive (EU) 2025/516.[2]

4.2 Why enforcement capacity becomes the bottleneck

As digital reporting becomes more standardised, tax administrations will routinely detect:

- missing invoices and missing credit notes in returns,
- duplicate deductions or a series of partial deductions (spanning for years) where the total amount exceeds the original VAT content,
- systematic period shifting of output reductions and input reductions.

The administrative challenge is no longer *finding* discrepancies, but deciding what happens *when a taxpayer ignores* a data-driven discrepancy.

5 Solution proposal: DRP (Automated Data Reconciliation with Due Process)

5.1 Design principles

DRP is built on five principles:

1. **Scope limited to arithmetic certainty:** automate only what the administration can prove from invoice data (and statutory timing rules), not complex deductibility judgments. Only obvious cases should be automatically sanctioned!
2. **One digital channel, structured responses:** taxpayers respond by selecting a standard “reason code” and attaching evidence where needed.
3. **Deemed acceptance + enforceable default outcome:** non-response triggers an automated assessment of the delta. In case of a no-response or unreasonable “reason code”, the delta is deemed as a valid error.
4. **Process to counter the abuse of rules:** the legally relevant timestamp is message delivery/availability, not the event of “opening/reading”.¹ This would solve a problem where the taxpayer always waits for a tax audit notice and submits a self-correction return before opening the message in the official electronic delivery mailbox of the company. There are several behavior patterns when taxpayers systematically abuse the legal opportunities granted to them.
5. **Proportionality:** thresholds, interest-based neutralisation of cash-flow advantage, and penalty escalation only for non-cooperation or repeated patterns.

5.2 Definitions

For a given VAT period t :

- **DDVP** — *Data-Determined VAT Position*: output and input totals computed from the invoice database (subject to formal conditions and statutory timing rules).
- **ARN** — *Automated Reconciliation Notice*: a digital notice showing the delta and its transaction-level drivers.
- **AAD** — *Automated Assessment of the Delta*: an enforceable assessment issued if the delta is not resolved in time.

5.3 Step-by-step DRP workflow

Step 0: scope and thresholds. DRP applies when:

- the delta exceeds a de minimis threshold (e.g., EUR 100) and/or a relative threshold (e.g., 1–2% of a base), and
- the delta is driven by invoice/credit-note records in the database (not by purely legal classification disputes).

¹This presumption of delivery is sufficient if it covers only the prohibition of self-revision and the general rules should still apply to other legal consequences.

Step 1: compute DDVP. Compute:

- DDVP-Output: VAT output implied by reported/cleared sales invoices and credit notes assigned to period t .
- DDVP-Input-Max: a “theoretical maximum” deductible VAT implied by received purchase invoices/credit notes present in the database, subject to baseline formal conditions.²

Step 2: compute the delta. Let $\text{Return}(t)$ be the taxpayer’s VAT return balance for period t . Let $\text{DDVP}(t)$ be the data-determined balance. Define:

$$\Delta(t) = \text{Return}(t) - \text{DDVP}(t).$$

Step 3: issue ARN (digital, itemised). The ARN must include:

- period t ,
- DDVP figures,
- the list of invoices/credit notes on which $\Delta(t)$ is based (downloadable as structured data),
- a structured response form with predefined reason codes.

Step 4: taxpayer responses (digital). Within a fixed response window (e.g., 15 days), the taxpayer can:

1. accept DDVP and file an auto-generated self-correction,
2. correct invoice data via correction workflows (then resubmit),
3. explain a legitimate deviation (e.g., non-deductible expenditure, partial exemption, contested invoice),
4. request human review for a limited set of complex reasons. (Difficult to pre-define the conditions.)

Step 5: default outcome — AAD if unresolved. If the taxpayer does not respond (or responds inadequately) by the deadline, the system issues an AAD:

- enforceable as a standard tax assessment,
- fully appealable under domestic administrative remedies,
- supported by the transaction-level evidence already disclosed in the ARN.

²The right to deduct and its conditions originate in the VAT Directive; procedural and formal conditions are implemented nationally.[1]

Step 6: interest and penalties calibrated to incentives. The core objective is to neutralise the treasury-financing advantage and to eliminate unfair competitive advantage:

- apply interest for the period of underpayment created by timing arbitrage,
- apply a proportionate penalty for non-response and repeated patterns (ARN without sanction encourage taxpayer to maintain the unlawful practice),
- reserve fraud-level sanctions for cases where additional evidence supports intentional deception beyond timing issues.

6 Credit notes, cancellations, and symmetric timing: closing the arbitrage loop

6.1 A symmetry rule for adjustments

For transactions within transaction-level reporting scope, the system should enforce:

- output VAT reductions from credit notes are recognised when the credit note is validly reported/cleared and linked to the original invoice;
- input VAT reductions are recognised in the same period, anchored to the same credit note record.

Chile offers a practical analog: buyer acknowledgment within 8 days (with deemed automatic acceptance) constrains strategic timing.[13]

6.2 Buyer acknowledgement as a control point

The EU and Chile differ in legal structure, but the enforcement logic is transferable: make the buyer-side VAT effect depend on a clear, time-bounded, system-visible event (acknowledgement, receipt confirmation, or digitally reported receipt record), rather than allowing indefinite drift in input-side adjustments.

7 Prevention, not only correction: draft returns and prefilled artifacts

Once invoice data is available, the administration can shift from “detect-and-chase” to “prepare-and-confirm”:

- Chile provides draft VAT returns (Propuesta de IVA) linked to transaction-level registers.
- Italy has moved toward prepopulated VAT returns and draft registers/settlement communications based on transactional data.[10]

DRP should include a *Draft VAT Return* view derived from DDVP:

- taxpayer confirms, or
- adjusts only the components requiring legal judgment (e.g., partial deduction prorata).

8 Cross-Member-State co-analysis: privacy, business confidentiality, and a regulatory gap

8.1 Why co-analysis matters in a DRR1/DRR2 world

DRR1 (cross-border) and DRR2 (domestic) data streams enable much stronger detection when Member States can co-analyse patterns across borders (e.g., supply-chain inconsistencies, carousel structures, cross-border timing arbitrage, and network anomalies). However, invoice-level reporting data is sensitive in two different ways:

- it can contain **personal data** (e.g., sole proprietors; names/contact data; identifiers);
- it contains **business-confidential information** (pricing, customers/suppliers, product/service descriptors, margins, and operational structure).

Achieving co-analysis therefore requires a governance model that is strict enough to preserve trust, yet flexible enough to allow effective, scalable analytics.

8.2 Personal data: the harmonised GDPR shield

For personal data, the EU already provides a directly applicable regulation: GDPR.[15] GDPR establishes EU-wide principles (lawfulness, purpose limitation, data minimisation, security, accountability) and an enforcement architecture involving national supervisory authorities and co-operation mechanisms for cross-border processing. This creates a more uniform compliance and remedy framework when a personal-data incident affects multiple Member States.

8.3 Business confidentiality: partial EU rules, but fragmented remedies

For VAT administrative cooperation, EU law includes confidentiality constraints. Council Regulation (EU) No 904/2010 provides that information communicated or collected pursuant to the Regulation shall be covered by official secrecy and enjoy the protection extended to similar information under the national law of the Member State which received it, and sets restrictions on permitted uses.[16]

At the same time, this legal technique explicitly links protection to national law. For a shared or federated EU-wide analytics ecosystem, this creates a fragmentation risk: the same shared dataset may be shielded by 27 different national “tax secrecy” regimes, with different remedies, processes, and sanctioning practices.

The EU also has a Trade Secrets Directive, implemented through national law, harmonising protection against unlawful acquisition, use and disclosure of trade secrets.[17] However, it is not designed as a GDPR-like cross-border regime for government-held, tax-purpose datasets with routine Member State-to-Member State exchanges, nor does it standardise incident-handling and remedies for cross-border leakage of DRR microdata.

8.4 Proposal: a Business Data Confidentiality Protection Regulation

To enable DRR-based cross-border co-analysis at scale while preserving trust, an EU Regulation (directly applicable) could provide a minimum baseline for *business data confidentiality* in tax-purpose data sharing. A Directive would likely lead to 27 implementations and maintain fragmentation for the same shared dataset.

A Regulation could standardise at least the following:

- **Scope and definitions:** DRR1/DRR2 microdata (including invoice-level lines where applicable) and derived analytics outputs shared for tax purposes.
- **Permitted-use, access, and onward-sharing rules:** purpose limitation, “need-to-know” access, strict governance for re-use, and harmonised rules for transfers to third parties or other agencies.
- **Minimum technical and organisational measures:** encryption (in transit/at rest), key management, logging and tamper-evident audit trails, role/attribute-based access control, segregation of duties, and secure processing environments (data enclaves).
- **Privacy- and confidentiality-preserving analytics:** encourage federated analytics (raw DRR2 stays national; shared outputs are risk indicators), pseudonymisation where workable, and aggregation techniques that reduce unnecessary exposure.
- **Incident response and breach coordination:** harmonised notification workflows to affected Member States (and, where appropriate, affected taxpayers), joint forensics and containment, and minimum remediation standards.
- **Enforcement and remedies:** cross-border standing and coordinated supervision, proportionate sanctions for negligent handling, and clear liability rules for harms arising from breaches of business confidentiality.

This would not replace GDPR; it would complement it: GDPR governs personal data processing, while the proposed regulation governs confidentiality and secure handling of business-sensitive transaction data exchanged under the VAT digital reporting ecosystem.

9 Do we need “TA levies VAT” instead of self-declaration?

No. A full replacement of self-assessment is neither necessary nor desirable for VAT’s business reality. Based on the nearly decade long experience, I suggest a different path:

- keep self-reported taxation as VAT is deeply interconnected to business decisions; automated processes of the tax administration can’t support company operation on the same level,
- automate enforcement for arithmetic/timing discrepancies that are provable from transaction-level data reported by the taxpayer,
- in case of discrepancy and the lack of reasonable explanation from the taxpayer, use default outcomes (AAD) and interest to eliminate the incentive to “borrow” from the Treasury,
- enable cross-border co-analysis under a trusted confidentiality regime (GDPR for personal data, plus a harmonised EU baseline for business data confidentiality) to detect carefully designed fraud schemes.

ViDA already signals the willingness of the member states to link certain VAT outcomes to digital compliance.[2]

10 Implementation blueprint

10.1 Phase 1: pilot

- limit DRP to large taxpayers or sectors where transaction-level data is already comprehensive (where the whole economy is covered the data integrity of small businesses is still an issue – eg. their practice with cancelled and amended invoices),
- implement ARN + structured responses + AAD default,
- measure: response rate, delta reduction, escalation volume.

10.2 Phase 2: scale with safeguards

- apply thresholds and risk segmentation,
- publish clear taxpayer guidance and a “why you got this notice” explanation,
- ensure robust appeal and correction channels,
- operationalise confidentiality: secure-by-design analytics environments, strict access logging, and incident response.

10.3 Phase 3: align with ViDA rollout

- consider that DRP logic can be the base of future EU-standard reporting streams,
- standardise correction workflows for credit notes and cancellations,
- adopt an EU-level business confidentiality baseline to avoid fragmentation for shared DRR analytics.

11 Conclusions

Transaction-level visibility makes VAT return arithmetic verifiable at scale. The policy risk is not “too little data” but “too little enforceability” for machine-proven discrepancies, and fragmented legal guaranty system for cross-border analytics. DRP closes the enforcement gap by combining (i) automated reconciliation, (ii) structured due process, and (iii) a default enforceable outcome for non-response, while preserving self-declaration. To fully realise ViDA’s potential for domestic and cross-border anomaly detection, Member States also need harmonised protection for business-sensitive DRR data.

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