International Labour Organization

E-formalization in Europe

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Foreword

Over 2 billion workers around the world are earning their livelihoods in the informal economy. Almost 1.6 billion of them have been significantly affected by the COVID-19 pandemic, leading to an estimated decline in their earnings of 60 per cent and undermining social cohesion. Informality manifests itself differently in developing and developed economies. Developed economies in Europe are concerned about its persistence and challenging nature as early as in 2016 to launch the European Platform tackling undeclared work in order to tackle the informal economy. They now consider formalization of the informal economy as a core priority for the recovery from the COVID-19 crisis.

While the ILO Recommendation 204 on Transition from the Informal to the Formal Economy provides policy guidance on facilitating the transition to formality, the ILO Centenary Declaration for the Future of Work recognizes the role of technological innovations that drives the transformative change in the world of work. Its human-centred approach promotes harnessing the fullest potential of technological progress and productivity growth to achieve decent work and sustainable development.

Before the COVID-19 crisis, many European countries have already pursued e-government initiatives. Now, with the lockdown and physical distancing measures resulting from the COVID-19 pandemic and considering the prospect of recovery, the application of new technologies in public policies to facilitate the transition to formality, called "e-formalization" policies, becomes a timely issue. The aim of this report is to evaluate e-formalization in European countries. It looks at some existing practices on e-formalization, especially measures in response to the COVID-19, to see how the transition to formality could be accelerated via e-formalization for mitigating the impact of COVID-19 on the informal economy and undeclared work and building the resilience of those in the informal economy for recovery and future crisis.

This publication benefits from technical comments from ILO colleagues: Javier Barbero, Juan Chacaltana, Vicky Leung and Philippe Marcadent.

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Opportunities for e-formalization due to COVID-19

Analysing the impact of the COVID-19 pandemic on informality in Europe, the lockdown and physical distancing measures taken to mitigate the spread of the coronavirus has resulted in a reduction of not only economic activity in the formal economy but also in the informal economy. There has been the contraction of "traditional" forms of informality, including unregistered enterprises, registered enterprises conducting a portion of their work on an undeclared basis, informal self-employment, unregistered employment, under-declared employment, and dependent self-employment. Moreover, many of these businesses and workers have been unable to access the short-term financial support schemes made available by governments to formal business and workers.

However, the lockdown has also resulted in the emergence of new forms of non-compliance and informality. These are arising from the abuse of the short-term financial support schemes and largely revolve around the bogus declaration of the suspension of employment contracts.

To tackle informality, the lockdown and physical distancing measures resulting from the COVID-19 pandemic has resulted in a decrease in onsite workplace inspections in Europe and the greater use of e-initiatives as a complement to the traditional onsite workplace inspection. Therefore, the COVID-19 pandemic has made e-formalization more relevant and pertinent, accelerating the trend towards the use of innovative, information-intensive and connectivity-based e-initiatives for tackling the informal economy.

Indeed, reviewing the association between the adoption of digital technologies and the prevalence of the informal economy, those European countries with a low level of adoption of digital technologies, measured by the Digital Economy and Society Index **(**DESI), have significantly larger informal economies.

Given this, a review has been undertaken of the wealth of e-formalization policy initiatives being pursued in Europe across the full range of policy tools available, along with good practice examples from an array of European countries.

E-formalization policy initiatives

E-formalization involves not just indirect e-initiatives that develop digital technologies in general which have an impact on informality. In Europe, there are many e-initiatives being directly used to address the transition to formality.

Indeed, e-formalization initiatives are being applied across the full spectrum of policy approaches and measures used for tackling the informal economy, namely:

- **Improving the risks of detection** – E-initiatives include: the development of e-registers of workers and businesses; advanced data mining tools to detect and prevent informality and non-compliance; smart ID cards; electronic complaint reporting tools; data-driven notification ("nudge") letters, and certified cash registers.
- **Sanctions** – E-initiatives include: new sanction systems to facilitate formalization only made possible due to the existence of e-registers; online compliance lists, and non-compliance/"naming and shaming" lists.
- **Improving the ease and benefits of operating formally**, using:
  - Supply-side incentives to make it easier and/or more beneficial for businesses and workers to operate in the formal economy. E-initiatives include: making formality easier using online e-registration of businesses and workers; pre-filling tax returns; using entrepreneurial accounts to simplify tax payments; online tax calculators, and online tax behaviour rating tools.
  - Demand-side incentives targeting customers with rewards for using formal goods and services. E-initiatives include: receipt lotteries; initiatives to incentivize electronic payments and deter and limit cash payments; and social label e-initiatives to encourage the purchase of formal goods and services.
- **Education and awareness raising** – E-initiatives include: e-announced advisory inspections; smart cards and apps to inform workers of their rights; use of Facebook messenger to provide advice and support; apps to allow citizens to evaluate the impact of their participation in the informal economy, and an array of online videos, virtual reality films, interactive games and quizzes to inform either suppliers or purchasers of the benefits of formality or costs of informality.
- **Modernizing formal institutions** – E-initiatives include e-services to make governments more customer-friendly and easily approachable so as to improve trust in government and prevent participation in the informal economy by enhancing perceptions of procedural and redistributive justice and fairness across government.

Recommendations

To facilitate further progress on the development of "e-formalization", the following recommendations are made:

- "E-formality", as an emergent concept, remains unfamiliar to most organizations involved in facilitating the transition to formality. Mutual learning events need to be organized to help the organizations involved in tackling the informal economy to better understand the concept of "e-formalization".
- These mutual learning events need not only to exchange knowledge, skills, resources and technical know-how on e-formality initiatives, but also facilitate learning of participants with each other about the challenges involved in making progress on e-formalization and how these can be overcome, so as to enable faster progress on e-formality than would otherwise be the case. There is no need for individual countries to "reinvent the wheel".
- The role of ILO and its experts in this regard can be to facilitate discussion on e-formality and identify and disseminate good practices.
- To ensure countries work as equal partners, and ensure equality and horizontality, the lesson from this report is that different countries are at different stages on each type of e-initiative. This is here shown to be the case on a North-North basis but is doubtless also the case on a North-South and South-South and Triangular Cooperation basis. It is therefore essential that this is recognized in mutual learning events.

1

Introduction and background

Although modernization theories in the 1950s and 1960s predicted a universal process of convergence of countries towards formal employment in a growing modern sector, the informal economy has shown, over the decades, a remarkable resilience and vitality. Even in the so-called "advanced" economies of Europe, the informal economy is persistent and a major challenge. It has a negative impact on: (i) workers' rights; (ii) the development of sustainable enterprises (i.e., on productivity, technological change and fair competition); (iii) the environment; (iv) public revenues and (v) governments' scope for action (European Commission, 2007; ILO, 2015).

Given these negative impacts, the transition to formality has risen up the policy agenda in countries across the world. In Europe, tackling the informal economy is now a core priority, reflected by the launch in 2016 of the European Platform tackling undeclared work.[1] Akin to Recommendation No 204 of the ILO (ILO, 2015) and the report of the Global Commission on the Future of Work (ILO, 2019), the European Platform tackling undeclared work views the need for structural transformation (including the digital transformation of government) to facilitate the formalization of the informal economy. How, therefore, can this transition to formality be achieved?

In many countries, a fragmented and uncoordinated approach exists across the multifarious government bodies responsible for the transition to formality and a limited involvement of social partners, as well as an incomplete range of policy measures used. This has been recognized in Europe (Williams, 2019a,

1 https://europa.eu/!fJ96uc

2020; Williams and Puts, 2018). To resolve this, the emergent consensus of the European Platform tackling undeclared work has been that a "holistic" approach (European Platform tackling undeclared work, 2017a), or what has been alternatively called an "integrated strategic" approach is required. This is where:

> a national government facilitates the transition to formality using a whole government approach to achieve the inclusive structural transformation required, joins-up the fields of labour, tax and social security law, involves social partners, and uses the full range of *direct* and *indirect* policy measures available to enhance the power of, and trust in, authorities respectively (Lapeyre and Williams, 2020).

Breaking this integrated strategic approach down, there are three major components in Europe:

- Shifting the objective from reducing the informal economy to preventing and formalizing the informal economy.
- Developing a whole government coordinated approach, comprised of four sub-components:
  - Cross-government coordinated strategy;
  - Coordinating operations across government;
  - Cross-government coordination on data mining, matching and sharing, and
  - Improving the involvement of social partners.
- Implementing the full range of direct and indirect tools, namely:
  - Implementing more effective sanctions;
  - Improving the risk of detection;
  - Improving the ease and benefits of engaging in the formal economy;
  - Implementing education and awareness raising campaigns, and
  - Modernizing enforcement authorities

In Europe, this holistic integrated strategic approach is the core guiding principle of the members and observers of the European Platform tackling undeclared work.[2] Indeed, reports have been produced on how to develop a coordinated approach and use the full range of policy measures to formalize the informal economy for the 27 European Union Member States plus Norway and Iceland (Williams, 2016, 2020a). Similar reports on developing an integrated strategic approach have been produced for the six Western Balkan economies (Williams, 2020b) and Azerbaijan, the Kyrgyz Republic, Tajikistan and Uzbekistan (Williams, 2021a).

Until now, however, the relationship between pursuing a holistic strategic integrated approach for the transition to formality and pursuing e-government initiatives has been less discussed. Here, this gap will start to be filled.

The aim of this report is to build upon a seminal publication that introduced the concept of "e-formality" and how new technologies applied in public initiatives, programmes, and policies can potentially make the transition to formalization easier (Chacaltana et al., 2018). Several reports have since investigated how governments are promoting the application of new technologies to simplify and facilitate the transition from the informal to the formal economy. Bhattaria (2018) has examined how technologies can enhance the impact of institutional public policies addressing informality in the Asia-Pacific region, Divald (2021) has examined e-formality in Estonia and Kring and Leung (2021), based on examples in Africa and Asia, presented the barriers to e-formality and proposed some guiding principles and building blocks for e-formalization policy development. The present report extends the study of e-formality by examining "e-formalization" in European countries. Here, "**e-formalization**" refers to the application of new technologies in public initiatives, programmes and policies to facilitate the transition to formality.

This is a timely issue because the lockdown and physical distancing measures resulting from the COVID-19 pandemic has made e-formalization more relevant and pertinent, not least due to the reduction in workplace inspections and adoption of e-initiatives as a complement to traditional onsite workplace inspections. Therefore, the pandemic has perhaps accelerated the trend towards the use of innovative, information-intensive and connectivity-based tools or approaches.

2 https://ec.europa.eu/social/main.jsp?catId=1323&langId=en

In the next section, therefore, the emerging opportunities for e-formalization due to COVID-19 will be reviewed by examining firstly, the impact of the COVID-19 pandemic on informality in Europe and secondly, the relationship between digital transformation and informality in the European context. Section 3 then maps out the wealth of e-formalization policy initiatives being pursued in Europe across the full range of policy tools available. This examines examples of e-initiatives in Europe applied to: (i) improving the probability of detection; (ii) sanctions; (iii) improving the ease and benefits of operating formally; (iv) education and awareness raising and (v) modernizing formal institutions. Section 4 then draws together some conclusions on a way forward which recognizes the relationship between the development of e-government and the transition to formality.

Throughout this report, the informal economy (a) refers to all economic activities by workers and economic units that are – in law or in practice – not covered or insufficiently covered by formal arrangements; and (b) does not cover illicit activities, in particular the provision of services or the production, sale, possession or use of goods forbidden by law, including the illicit production and trafficking of drugs, the illicit manufacturing of and trafficking in firearms, trafficking in persons, and money laundering, as defined in the relevant international treaties (ILO, 2015).

In the European Union, the informal economy is more normally referred to as "undeclared work", which has a similar scope of what is included and excluded. Undeclared work refers to any paid activities that are lawful as regards their nature but not declared to public authorities, taking account of differences in the regulatory systems of the Member States (European Commission, 2007). The main reason in Europe these paid activities are viewed as not declared to the authorities is for the purposes of evading either labour, tax and/or social security legislation or regulations. If paid activities are non-compliant in other ways, it is not undeclared work. If the goods and services provided are unlawful (e.g., the production or trafficking of drugs, firearms, persons or money laundering forbidden by law), it is part of the wider criminal economy and part of the wider shadow economy (often defined as including both the undeclared economy and the criminal economy), and if there is no monetary payment, it is part of the unpaid sphere (European Platform tackling undeclared work, 2018a).

2 Opportunities for e-formalization due to COVID-19

In this section, the emerging opportunities for e-formalization due to COVID-19 will be reviewed by examining firstly, the impact of the COVID-19 pandemic on informality in Europe and secondly, the relationship between structural e-transformation and informality in the European context.

2.1. What is the impact of COVID-19 on informality in Europe?

In early January 2020, a new strain of coronavirus (SARS-CoV-2) producing a respiratory disease (COVID-19) began spreading across the globe. On the 30th January 2020, the World Health Organization declared a global health emergency and on the 11th March a pandemic was confirmed. The impact on businesses and workers, as well as economies, was profound. By April 2020, the closure of businesses to restrict movement and the spread of the virus had affected 81% of the global workforce (ILO, 2020b) and by January 2021, 93% of the world's workers lived in countries with workplace closure measures (ILO, 2021a). The result was initiatives to protect workers, support jobs and income, and stimulate the economy and employment, including social protection for those affected, support for employment retention, and financial and tax relief for the affected enterprises (ILO, 2020d, e).

In Europe, similar to other global regions, governments responded by offering unprecedented short-term financial support to enterprises and workers affected (Eurofound, 2021). In the European Union, one key response was the development of employment retention schemes, largely funded by a €100 billion "Support to mitigate Unemployment Risks in an Emergency" (SURE) programme (European Commission, 2020a). These employment retention schemes have effectively preserved jobs by giving businesses financial support to temporarily reduce the hours of employees or suspend their employment, with government funding covering the hours not worked. However, these schemes differ across European countries, such as in terms of the criteria used to determine whether an employer can access support. For further information on the employment retention schemes, as well as other short-term rescue packages, adopted in Europe and beyond, "knowledge banks" exist that have been developed by Eurofound[3], ILO[4] and IMF[5].

However, this short-term financial support has been only available to enterprises and workers operating in the formal economy prior to the lockdown. Those who were operating in the informal economy have been largely unable to access this short-term financial support (Biletta, 2020; ILO, 2020a,c). Indeed, those in the informal economy have been disproportionally affected by the lockdown, as it is precisely those sectors with high levels of informality (e.g., personal services, restaurants and hospitality) that were hardest hit and have been the last to re-open. Given that the informal economy prior to the pandemic was estimated as equivalent to 15.8% of GDP in the EU (Williams and Schneider, 2016) and that 11.6 % of all labour input in the private sector was undeclared (Williams et al., 2017), a large proportion of EU workers and enterprises have been unable to access in full or in part the short-term financial support provided to businesses and workers by governments. However, this varies according to the different types of enterprise and worker in the informal economy.

Two types of enterprise operate in the informal economy. Firstly, there are **unregistered enterprises**, which are mainly sole traders operating on a self-employed or own-account basis and micro-enterprises (Williams, 2017). Eight out of ten enterprises globally operate in the informal economy (ILO, 2020c). Taking the example of tourism, which is a sector where informality is prevalent and the lockdown has had severe impacts, such unregistered enterprises and own-account workers might include beach sellers, unlicensed tour guides, private accommodation providers or small guesthouses, meal providers on online platforms, home restaurants and "pop up" shops. These unregistered enterprises and own-account workers have been wholly excluded from accessing the short-term financial support.

Secondly, there are **registered businesses** that declare only a portion of their work and revenue. According to the International Conference of Labour Statisticians (ICLS) definition, the informal employment status of the independent workers differs in the two cases. Independent workers are in informal employment in unregistered enterprises and are not in registered enterprises. These registered businesses and independent workers can only access short-term financial support to offset the shortfalls in their declared turnover or profits and for their declared employees.

Turning to informal employees, three dominant types exist in a European context (in addition to the informal own-account workers mentioned above). Firstly, there are **unregistered employees** where the employees do not have written contracts or terms of employment and their remuneration is most probably undeclared. Although the existence of a contract is not the criteria used to measure informal employment and therefore informalization, it is a measure of non-declaration. Both the 2013 and 2019 Eurobarometer surveys reveals that one in 20 (5%) in employment in the EU report not having a written contract of employment (Williams and Kayaoglu, 2017; Williams and Horodnic, 2020a). The 2019 Eurobarometer survey was conducted immediately prior to the pandemic. Importantly, the sectors most severely affected by the lockdown are those in which unregistered employment is particularly prevalent. Examining the 2015 European Working Conditions Survey, one in seven employees (14%) in accommodation and food services were in unregistered employment, rising to 50% of all employees in accommodation and food

3 https://www.eurofound.europa.eu/data/covid-19-eu-policywatch. See also: Eurofound (2020), *COVID-19: Policy responses across Europe,* Publications Office of the European Union, Luxembourg.
4 https://www.ilo.org/global/topics/coronavirus/regional-country/country-responses/lang--en/index.htm
5 IMF (2020). *Policy responses for COVID-19*. Available at: https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19

services in Cyprus[6], 37% in Malta and Ireland, and 33% in Greece (Williams and Horodnic, 2020b). These workers have been wholly excluded from the current short-term financial support for employees, as has been recognized by the EU Agency for Fundamental Rights.[7] Depending on the system of social insurance in European countries, they have been also often excluded from welfare benefits, although many governments have bolstered their social protection, such as by introducing the temporary enhancement of unemployment insurance benefits and relaxing eligibility rules for benefits (IMF, 2020).

Secondly, there are **under-declared employees**. These employees have a formal job but receive two wages: an official declared wage (often paid at the minimum wage rate) and an additional undeclared "envelope wage". In 2013, one in 33 declared employees in the EU received envelope wages amounting on average to 25% of their gross salary (Williams and Horodnic, 2017a) and again one in 33 in 2019, with 34% of those in under-declared employment receiving less than a quarter of their gross salary as an envelope wage, 10% receiving 25-49 % of their gross salary as an envelope wage and 5% received 50% or more of their gross salary as an envelope wage (Williams and Horodnic, 2020a). These under-declared employees, depending on the social insurance system, may receive lower benefits under the government salary replacement schemes than if their full wage had been declared.

Thirdly, there are the **bogus self-employed** (disguised employment in ILO terminology). These workers are registered as self-employed but operate under the same working conditions as direct employees and/or they depend on a single employer for a large share or all their income. In the EU, 4.3% of all employment is bogus self-employment (Williams and Horodnic, 2019). These misclassified workers will be excluded from the financial support for employees but able to access financial support for the self-employed.

It is not just the exclusion from short-term financial support of enterprises and workers previously operating in the informal economy that has been a concern. A further emerging concern in Europe is that abuse of the short-term employment retention schemes by employers has resulted in the emergence of new forms of non-compliance and informality in Europe during this pandemic period. Box 1 summarizes these new types of non-compliance and informality, which largely involve the "bogus declaration of the suspension of work", that are arising from abuse of the employment retention schemes and short-term financial support schemes supporting business more generally.

Box 1. New types of non-compliance and informality resulting from abuse of employment retention schemes

- Employers claim support for the temporary suspension of employment contracts and either:
  - Workers continue to work as normal, not knowing the employer is claiming for them;
  - Employs the worker (for whom they are claiming support) on either (i) an undeclared basis or (ii) "bogus part-time" basis;
  - Asks them to "volunteer" (and threaten with fear of redundancy)[8];
  - Employs them in a linked company;
  - Employs new workers, or
  - Submits claims for higher hourly wages than were earned by the employee.
- Employers claim for a "ghost" employee such as someone made redundant, or non-existent (although declaring an employee who does not exist is an illicit activity and is perhaps better not considered as part of the informal economy).

6 These unregistered workers do not contribute to the social insurance fund so are ineligible for the benefits provided under the supplementary budget to provide short-term financial support. This has received media attention: https://cyprus-mail.com/2020/05/03/cyprus-economy-responding-to-the-covid-19-virus/

7 https://fra.europa.eu/en/news/2020/protecting-workers-fundamental-rights-tackling-impact-covid-19

8 https://news.sky.com/story/coronavirus-hundreds-of-firms-suspected-of-pressuring-furloughed-staff-to-work-11987358 ; https://www.bbc.co.uk/news/business-52745983; Goupil (2020).

Given that many labour inspectorates have been heavily focused upon occupational safety and health (OSH) issues during the pandemic, evaluations of the level of these new forms of informality arising from abuse of the short-term financial support are currently lacking.

Nevertheless, in the UK, Her Majesty's Revenue and Customs (HMRC) have estimated that the fraud and error associated with the employment retention scheme alone is €4 billion and a taskforce involving 1,265 full-time staff costing €110m has been established to tackle the abuse of the short-term financial support schemes (Agyemang, 2021). In France, meanwhile, two surveys have provided estimates of the extent to which employers claiming support for the temporary suspension of employment contracts are continuing to employ these workers (for whom they are claiming support) on a "bogus part-time" basis (Goupil, 2020). More than a million companies in France have submitted a partial activity request for over 13 million employees (DARES, 2020). A 2020 survey of 34,000 people reveals that 31% had continued normal working despite being in total partial unemployment or sick (UGICT-CGT, 2020). A further survey of 2,600 employees reveals that 24% in total partial unemployment have been required to continue their activity at the request of their employer (Delgenes, 2020).

In sum, the lockdown and pandemic has resulted in the reduction of not only economic activity in the formal economy but also in the informal economy. This involves the temporary contraction of "traditional" forms of informality, including unregistered enterprises, registered enterprises conducting a portion of their work on an undeclared basis, informal self-employment, unregistered employment, under-declared employment, and dependent self-employment. However, the lockdown has also resulted in the emergence of new forms of informality associated with the short-term financial support schemes put in place for businesses and workers. These largely involve various types of "bogus declaration of the suspension of work" (see Box 1).

With the lockdown, the policy instruments used to tackle informality have also changed. As a result of the need for physical distancing, there has been a decrease in onsite workplace inspections in Europe. For example, at the plenary meeting of the European Platform tackling undeclared work, member states were asked in a poll, "What proportion of inspections for undeclared work is now taking place on site?". Of the 22 representatives of European enforcement authorities responding, 23% stated that less than 20% of all inspections were onsite, 5% that 20-40% were onsite, 18% that 40-60% were onsite, 27% that 60-80% were onsite and 27% that more than 80% were onsite.

As such, enforcement authorities have turned to alternatives to the physical onsite workplace inspection when tackling the informal economy, many of which have been e-initiatives. Before providing an in-depth review of these e-initiatives, it is necessary to briefly review the shift that has been taking place over the past decades towards e-government in Europe and the association between this adoption of e-government and the prevalence of the informal economy.

2.2. Relationship between structural e-transformation and informality

The impact of the use of technologies on formality has been viewed from two different perspectives in Europe. On the one hand, and akin to other global regions (see ILO, 2021b), there is a burgeoning literature on how technologies have led to the creation of digital platforms (sometimes referred to as the "collaborative" or "sharing" economy) and that the resultant platform work has increased the prevalence of informality (Eurofound, 2018; Hauben et al., 2020; Heyes and Newsome, 2017; Williams and Horodnic, 2017c; Williams et al., 2020). Indeed, by late 2019, 10% of all undeclared work in the European Union was sourced through digital platforms (Williams and Horodnic, 2021). From this perspective, therefore, the overarching narrative is that digital technologies are having harmful impacts on formality. On the other hand, however, there is a smaller but growing more "positive" literature that examines how new technologies applied in public initiatives, programmes, and policies can potentially make the transition to formalization easier (Bhattaria, 2018; Chacaltana et al., 2018; Divald, 2021; Kring and Leung, 2021). It is this application of new technologies in public initiatives, programmes and policies to facilitate the transition to formality ("e-formalization") that is the focus here.

With the advent of new technologies, many countries around the world have embarked on e-government processes. Although there is some discussion, **e-government** is usually defined as the use of Information and Communication Technologies (ICTs) to improve the activities of public-sector organizations. Through advanced technological tools: "E-government aims at improving the relationship between people and their government … making public services delivery more effective, accessible and responsive to people's needs… increasing participation in decision making and making public institutions more transparent and accountable." (UNDESA, 2016).

In the European Union on 17 June 2010, the European Council adopted the "Europe 2020 - A strategy for smart, sustainable and inclusive growth" economic strategy. Europe 2020 sets out a vision for Europe's social market economy based on three interlocking and mutually reinforcing priority areas:

- **Smart Growth:** developing an economy based on knowledge and innovation;
- **Sustainable Growth:** promoting a low-carbon, resource-efficient and competitive economy; and
- **Inclusive Growth:** fostering a high-employment economy delivering social and territorial cohesion (European Commission, 2017)

Within the framework of actions contributing to the **Smart Growth** priority area, the **Digital Agenda for Europe** has been a flagship initiative for lifting up the EU economy by making the best use of ICTs.

The main initiatives have been the **Digital Single Market**[9] and the **eGovernment Action Plan** 2016-2020.[10] The eGovernment Action Plan called for the acceleration of the digital transformation of governments. In February 2020, a new **digital strategy** was adopted[11] followed in 2021 by a ten-year **2030 Digital Compass** roadmap, which includes the development of accessible and human-centric digital public services and administration and by 2030, 100% online provision of key public services for European citizens and businesses (European Commission, 2021a).

To measure progress in the adoption of digital technologies, the European Commission has developed the **Digital Economy and Society Index (DESI)** (European Commission, 2020b). The DESI is calculated as the weighted average of five main dimensions: connectivity (25%); human capital (25%); use of internet (15%); integration of digital technology (20%), and digital public services (15%). A score from 0 minimum to 100 maximum is allocated. Figure 1 displays the results for the overall DESI index.

When examining digital public services, the DESI examines 5 indicators:

- **e-Government users** – people who sent filled forms to public authorities, over the internet, previous 12 months.
- **Pre-filled forms** - amount of data that is pre-filled in public services' online forms.
- **Online service completion** - the share of administrative steps related to major life events (birth of a child, new residence, etc) that can be done online.

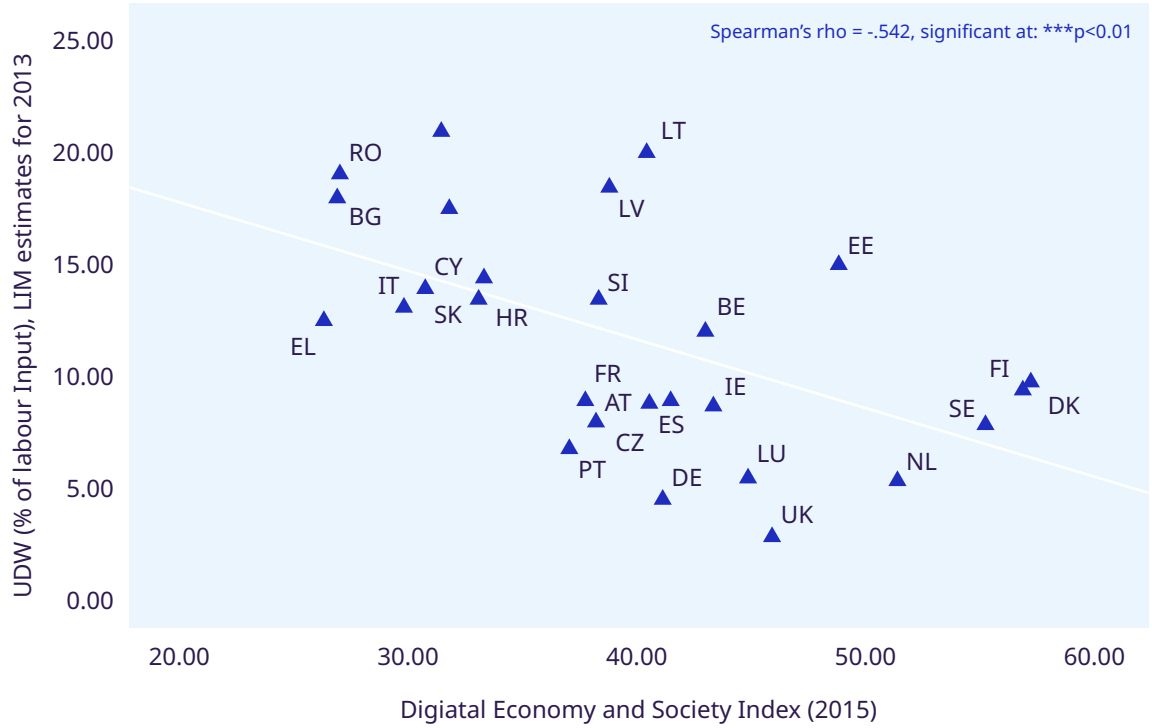
9 https://ec.europa.eu/commission/priorities/digital-single-market_en
10 https://ec.europa.eu/digital-single-market/en/news/communication-eu-egovernment-action-plan-2016-2020-accelerating-digital-transformation
11 https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/shaping-europe-digital-future_en

- **Digital public services for businesses** - share of public services needed for starting a business and for conducting regular business operations available online for domestic and foreign users. Services provided through a portal receive a higher score, services which provide only information (but have to be completed offline) receive a more limited score.
- **Open data** - this composite indicator measures to what extent countries have an open data policy in place, the estimated political, social and economic impact of open data and the characteristics (functionalities, data availability and usage) of the national data portals.

In recent years, a growing number of studies have suggested that e-government could limit the scope of informality and facilitate the transition to formality (Chacaltana et al., 2018; Elbahnasawy, 2021; Goel and Saunoris, 2016; Remeikiene and Gaspareniene, 2016; Rohman and Veiga, 2017; Son et al., 2017; Uyar et al., 2021; Veiga and Ibrahim, 2017). Two exploratory studies have also suggested that this relationship between e-government and informality exists in Central and Eastern Europe (Bayar, 2016; Zait and Horodnic, 2021).

Here, this relationship between e-government and the level of informality is evaluated in Europe. Figures 1 and 2 graphically portray the significant association between the adoption of digital technologies, measured by the Digital Economy and Society Index (DESI), and the prevalence of informality across the EU. Figure 1 examines undeclared work as a percentage of total labour input. It reveals how countries with a low level of adoption of digital technologies, measured by the DESI, have significantly higher levels of undeclared work as a percentage of total labour input. Of course, correlation does not imply causation.[12]

Figure 1. Relationship between undeclared work (% of labour input) and adoption of digital technologies (DESI)

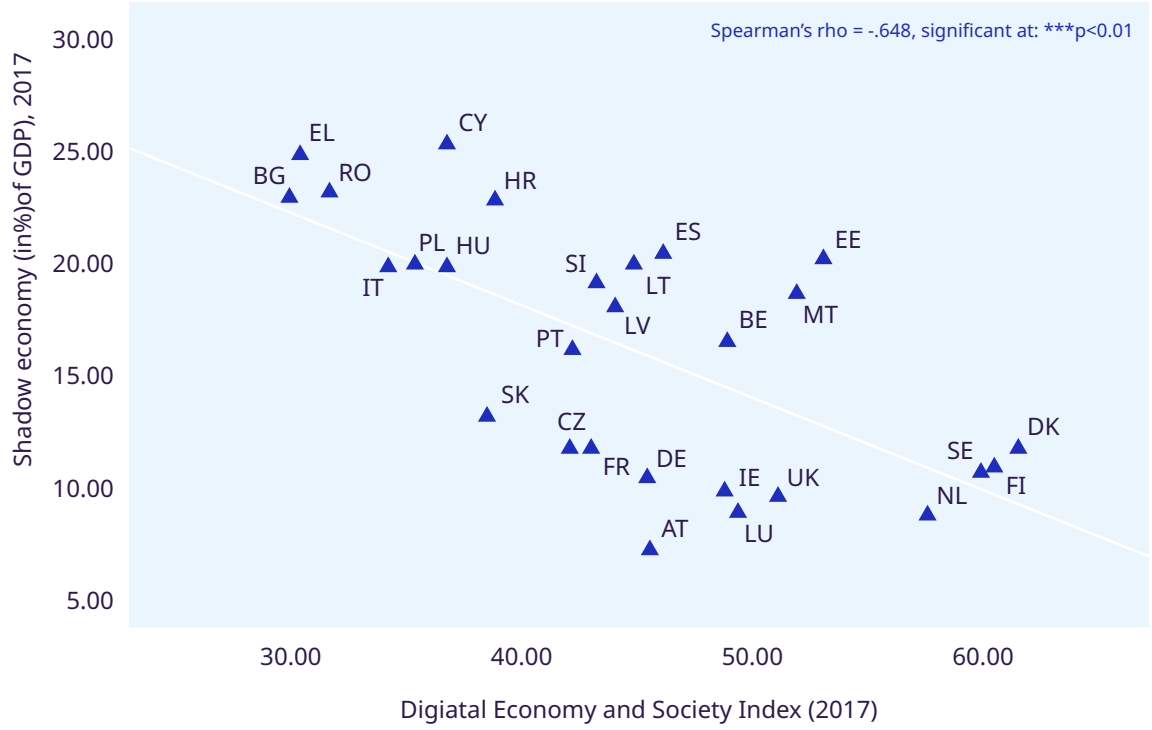


Sources: data extracted from Williams et al. (2017) and https://digital-agenda-data.eu/datasets/desi/indicators.

12 Future research needs to not only move beyond these bivariate correlations by conducting multivariate regressions where other variables that may influence the level of informality are held constant, but also to analyse the evolution of the relationship over time.

Figure 2 examines the relationship between the relationship between the adoption of digital technologies and the size of the shadow economy. It reveals that the countries with a low level of adoption of digital technologies, measured by the DESI, have significantly larger shadow economies.

▶ Figure 2. Relationship between shadow economy (as % of GDP) and Digital Economy and Society Index



Sources: Medina and Schneider (2019); https://digital-agenda-data.eu/datasets/desi/indicators.

Table 1 examines the relationship between cross-country variations in the provision of digital public services and the prevalence of the informal economy. Reporting the bivariate correlations using Spearman's rank correlation coefficient, this reveals a significant association between cross-country variations in the overall DESI and both measures of the prevalence of informality. The greater is the provision of digital services the lower is the prevalence of the informal economy.

However, there is only a significant association between the development of e-government and the size of informality when the shadow economy measure is used. Breaking down e-government into its component parts, there is no significant association between the proportion of e-government users and the extent of the pre-filling of forms and participation in informality. Nevertheless, there is a significant association between online service completion and informality, and digital public services for businesses and informality on both measures of informality. Care, however, is required in interpreting the results since other determinants of informality are not held constant in these simple bivariate correlations, such as GDP per capita, social protection expenditure, etc. Tables A1-A7 in the Appendix provide the scores for each European country on the overall DESI, the e-government sub-dimension and the five indicators that constitute this e-government dimension over the period 2015-2020. Table A8 reports the country-level data on the prevalence of the undeclared work and the shadow economy.

▶ **Table 1. Relationship between informal economy and digital services: EU countries, Spearman correlations)**

Digital agenda indicators[1]) [1]	Undeclared work (% of labour input), LIM estimates for 2013 [2]	Shadow economy (% of GDP), 2017 [3]
Digital Economy and Society Index	-0.542***	-0.648***
5a e-Government	-0.217	-0.364*
5a1 e-Government Users	0.032	-0.125
5a2 Pre-filled Forms	-0.056	-0.274
5a3 Online Service Completion	-0.342*	-0.401**
5a4 Digital public services for businesses	-0.369*	-0.341*
5a5 Open Data[2])	-0.101	-0.017

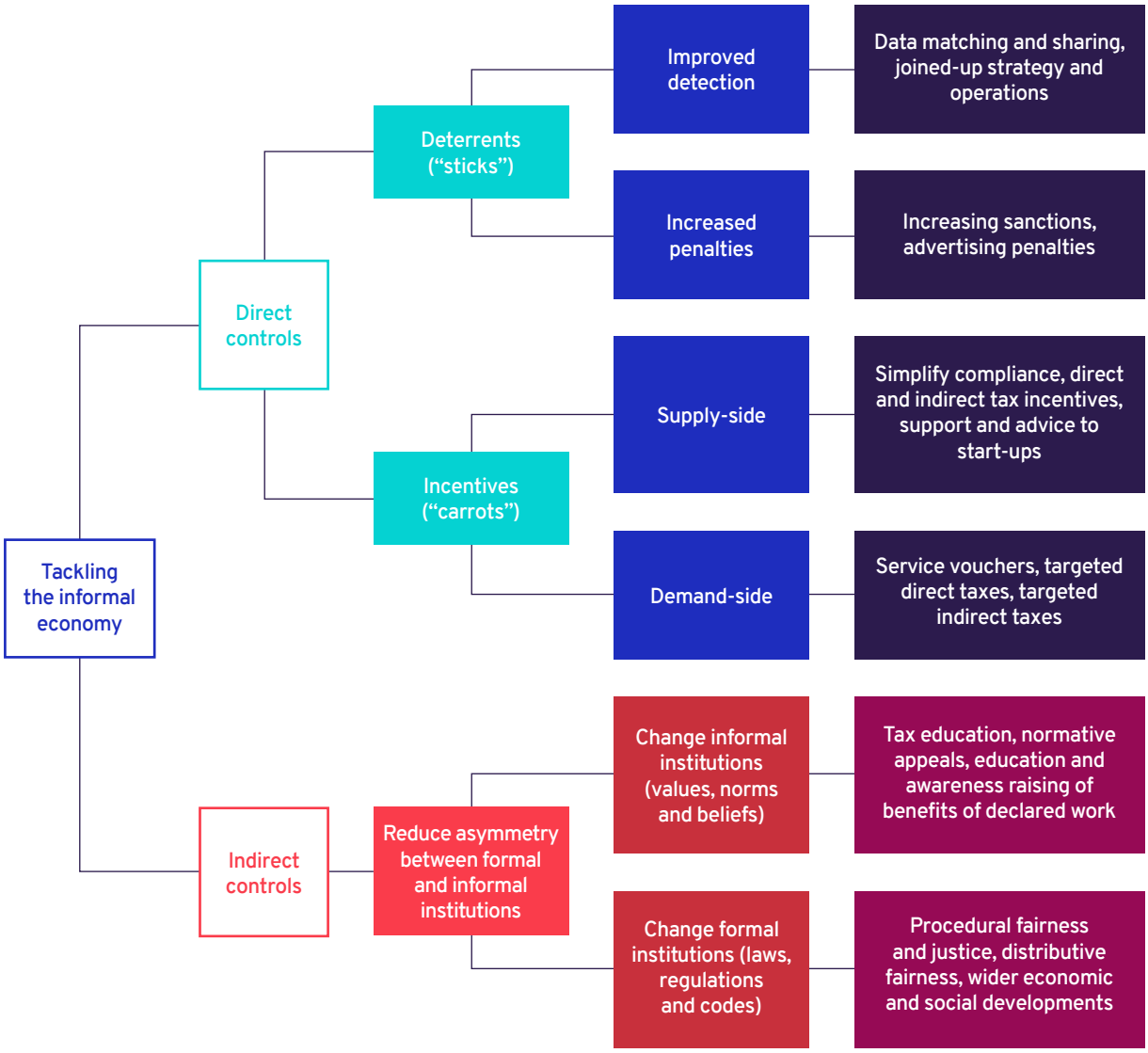
Notes: Significant at *** p<0.01, ** p<0.05, * p<0.1
1) 2015 data for correlation with Labour Input Method (LIM) estimates and 2017 data for correlation with the shadow economy estimates; 2) 2020 data for correlation with LIM and shadow economy estimates.
Sources: [1] https://digital-agenda-data.eu/datasets/desi/indicators; [2] Williams et al. (2017); [3] Medina and Schneider (2019).

Given this significant relationship between digitalization and informality, and especially online service completion and digital public services for businesses, attention now turns to the range of e-initiatives used in Europe to facilitate the transition to formality.

3 E-formalization policy initiatives

Figure 3 describes the full range of policy measures and approaches available for facilitating the transition to formality using the typology developed by the European Platform tackling undeclared work (European Platform tackling undeclared work, 2017a). Firstly, there are deterrence measures that raise the costs of informality by increasing the risks of detection and penalties. These "sticks" would perhaps suffice if the goal were simply to reduce the informal economy. However, given that the goal is to facilitate the transition to formality, it is necessary to use not only deterrents but also policy measures to incentivize formalization by making formality easier and more beneficial (i.e., "carrots"). These can be supply-side incentives which make it easier for workers and employers to operate in the formal economy or demand-side incentives which make it easier and more beneficial for purchasers to buy formal goods and services. These improve the benefits of formality. However, informality is not always purely a rational economic decision (e.g., Allingham and Sandmo, 1972; Hasseldine and Li, 1999; Richardson and Sawyer, 2001), so merely ensuring that the expected costs outweigh the expected benefits is insufficient. Informality also results from formal institutional failings that lead to the non-alignment of the laws and regulations (state morale) with what populations view as acceptable (civic morale). Therefore, on the one hand, educational and awareness raising campaigns need to be pursued to align civic morale with state morale. On the other hand, given that the acceptability of informality is unlikely to change without improvements in the formal institutions, broader inclusive structural transformation policies are also required to nurture the social contract between the state and its citizens.

▶ **Figure 3.** Policy approaches and measures for tackling the informal economy



These direct and indirect policy measures are not mutually exclusive. The evidence is that direct controls ("sticks" and "carrots") to increase the power of authorities to promote *enforced compliance* need to be combined with indirect controls to promote *voluntary compliance*. When there is effective enforced compliance as well as high voluntary cooperation, the informal economy is smaller and the reduction more sustainable. When there is ineffective enforced compliance and little voluntary cooperation, the informal economy is more extensive (Alm and Torgler, 2011; Alm et al., 2012; Horodnic and Williams, 2020; Kastlunger et al., 2013; Khurana and Diwan, 2014; Kirchler et al., 2008; Kogler *et al*., 2013, 2015; Muehlbacher et al., 2011a, b; Prinz et al., 2013; Williams and Horodnic, 2017b). For this reason, the 29 countries who are members of the European Platform tackling undeclared work have adopted a full policy operationalization model that uses both direct and indirect controls (European Platform tackling undeclared work, 2017a, 2018a).

Below, therefore, a review is undertaken of the use of e-formalization initiatives in Europe across the full range of direct and indirect policy measures. This reviews the use of e-initiatives to improve firstly, the probability of detection, secondly, sanctions, thirdly, the ease and benefits of operating formally, fourthly, education and awareness raising and fifth and finally, modernizing formal institutions.

3.1. Improving the risks of detection

Many countries tackle the informal economy by increasing the costs of participation in informal work. A first set of deterrence measures ("sticks") to increase the costs of operating in the informal economy relate to increasing the perceived or actual likelihood of detection. Here, e-initiatives to improve the likelihood of detection of informality are reviewed related to:

- Data collection, sharing and analysis initiatives;
- Electronic complaint reporting tools;
- Data-driven notification letters, and
- Certified cash registers.

3.1.1. Data collection, sharing and analysis

A first step that can be taken is to collect data. To do so, e-registers on businesses and employment have been introduced. This then enables improvements in preventing informality by enabling data-driven risk-assessment to select:

- businesses for workplace inspections;
- businesses and workers to whom notification letters can be sent, and
- businesses, workers and citizens to target with educational and awareness raising materials.

The implementation of effective e-registers requires:

- the development of an IT system that collects and stores comprehensive and high-quality up-to-date individual-level data, and
- databases (e.g., employment registers, business registers, tax registers) that:
  - collect the data/fields/variables required to detect informality;
  - have access to these data on a real-time/up-to-date basis;
  - are available to all relevant levels of the organization who need these data, including inspectors.

The major **challenges** when developing e-registers are that enforcement authorities need:

- the financial resources to develop them;
- the technical skills to develop and use them;
- appropriate legislation on personal data and privacy safeguards that enables access to such data for enforcement authorities, and
- "political support" to develop them.

Boxes 2-4 provide examples of the development of e-registers and their outcomes in Europe. Box 2 reports the electronic Register of Employment in Estonia, Box 3 the Revisal Employment Register in Romania and Box 4 the Incomes Register in Finland.

Box 2. Electronic Register of Employment, Estonia

Aims: the objectives of the introduction of the Employment Register have been:

- to increase the availability of electronic data and bring information relating to employment into a single system;
- to reduce the administrative burden on employers and various public sector stakeholders, to simplify the operating principles of the social guarantee system;
- to reduce informality, and
- to improve social protection.

Description: In Estonia from 1 July 2014, employers are required to register their employees in the electronic Employment Register before the employee starts work. The Register contains up-to-date data on employment in one place. Registration is required for all employees, including those working on a voluntary basis. Registration can be carried out by: E-Channel (E-Tax/E-Customs); at the Estonian Tax and Customs Board (ETCB), or by phone or SMS. Paper submissions have been eliminated. Employers can access their "live" employee data and change it at any point in time. Employees also receive automatic notification when their employment is registered and can check to ensure it is correct. Data from the Employment Register is used for example to: determine health insurance; determine unemployment benefits (on termination of employment); monitor the working conditions of migrant workers; monitor and investigate accidents at work, and verify tax compliance (labour taxes).

▶ Box 2. (cont.)

Alongside the electronic register, IT tools have been introduced for the ETCB tax auditors. A mobile app has been developed, which enables officials carrying out inspections to use smartphones to gain direct access to the Employment Register, including a photo of the employee, alongside his/her employment data.

The initial cost to set up the electronic Employment Register was €403,200. The annual maintenance cost is around €33,000. The Register of Employment is the responsibility of the Estonian Tax and Customs Board (ETCB).

Evaluation: A media campaign and press releases advertised the Register and its importance. These were necessary to inform people to use the database. Informality has been reduced due to the Employment Register. Following the new requirements to register workers in the online register from 1 July 2014, an additional 21,000 workers were registered resulting in an additional €11.8 million tax revenue collected in 2014. Using the Employment Register data and examining the proportion of unregistered workers identified during inspections as a percentage of the workers employed in the firms where inspections were carried out (controlled employees), the share of unregistered employment decreased from 10% in 2014 to 6.3% in the first quarter of 2016.

Source: https://ec.europa.eu/social/BlobServlet?docId=17227&langId=en

▶ Box 3. REVISAL Employment Register, Romania

Aim: The aim of this electronic employment register has been to:

- reduce the bureaucratic burden of registering labour contracts, and
- increase the capacity of the labour inspectorate to detect informality by (i) increasing the transparency of employers' obligations and (ii) providing labour inspectors with substantial information before going into the field.

Description: Since 1 January 2011, registration of labour contracts has been done exclusively through the REVISAL system. All employers are obliged by law to fill in the database, using a desktop application which is provided free of charge by the Labour Inspectorate. Employers must send a complete record of employment for each new employee to the territorial Labour Inspectorate not later than the last working day before the employee's start date. Information in the database includes:

- Details about the employee, e.g., name, citizenship, personal identification code;
- Starting date of the individual employment contract;
- Job title, type of contract, working hours, salary and bonuses;
- The period and reasons of suspension of the individual employment contract, as well as the termination date.

Termination of employment contracts must also be sent to REVISAL which is then sent to the Labour Inspectorate within 20 working days (maximum) from when the work terminates. The legislation clearly stipulates that if a company does not register a labour contract before the employee's start date, it is considered undeclared work and a fine can be imposed.

Evaluation: REVISAL has considerably reduced the bureaucratic burden of employers. Furthermore, the system is used to select workplaces for inspection and improves the efficiency of inspections since labour inspectors have access to key details about employee labour contracts.

Success factors are: availability to all companies of a desktop app; provision of comprehensive guidelines on how to install and use the system; and the integration of the system into payroll software.

Source: https://ec.europa.eu/social/BlobServlet?docId=21643&langId=en

▶ Box 4. The Incomes Register, Finland

Aims: The Incomes Register enables individuals' earnings to be reported in real time, whenever a payment is made. The objectives are:

- To simplify and clarify employers' reporting obligations and simultaneously reduce the administrative burden involved;
- To tackle informality by increasing the real-time transparency of the fulfilment of employers' obligations and enable efficient detection of omissions;
- To make income-related reports available automatically;
- To create direct communication between private payroll systems and the Incomes Register;
- To provide a real-time user interface for citizens concerning their own earnings, pensions, and benefits, and
- To provide reports for different authorities according to each authority's mandate.

Description: The Finnish Incomes Register provides an up-to-date, comprehensive repository of individual earnings, social insurance contributions, benefits and pensions data which various authorities and all employers are obliged to report. It deters informality by allowing the Finnish Tax Administration to establish whether all the above required payments have been made, reducing the likelihood of companies not reporting all incomes or reporting inconsistent information to different authorities.

The Incomes Register development project (KATRE) started in 2014 as part of a wider national digital infrastructure development programme. The law on the Income Information System (53/2018) obliged the relevant authorities and employers to use the new electronic system as a tool for reporting all payments by employers, benefits and pension providers. The first phase came into force on 1 January 2019 starting with the reporting of salaries and earnings. Phase two came into force 1 January 2021 introducing the reporting of benefits and pensions.

The main characteristics are:

- The Register interface provides two user roles: those reporting on payments (e.g., employers) and those viewing payments made (e.g., citizens, government authorities);
- Employers as well as pension and benefit providers report all payments through the same electronic system, which conveys the information to each data user according to their legal entitlement;
- The reports include details of social, health, pension, accident and occupational disease contributions, and unemployment insurance contributions of varying types;
- The deadline for reports is 5 calendar days after a payment is made;
- Failure to report results in a fine of €135 for a delay up to 45 days, and after that, a maximum fine of €15,000 per month is imposed, and
- The system allows citizens to access their own up-to-date payments and produce different reports from the data for various uses.

Evaluation:

- 87% of employers report digitally and automatically. Only 0.04% submit paper reports;
- Successful cooperation with private systems providers to build technical interfaces from the private payroll systems to link with the government Incomes Register;
- There is real-time data and transparency for data users, employers and citizens.

Success factors include: providing ready-to-use materials for communications and training; and adequate provision of resources for customer service in the beginning (first few months) before employers etc. are familiar with the new practice.

Sources: https://ec.europa.eu/social/BlobServlet?docId=21459&langId=en
Incomes Register web page: https://www.vero.fi/en/incomes-register/
Incomes Information System (53/2018): https://www.finlex.fi/fi/laki/alkup/2018/20180053
English education material on Register: https://www.youtube.com/watch?v=dGdmL3n34JE

There are also more specific e-registers used in sectors prone to informality, such as the construction sector. Box 5 reports the Declaration of Work and Checkin@Work e-registers used in the Belgium construction sector.

▶ Box 5. Declaration of Work and Checkin@Work e-registers in the construction sector, Belgium

Aim: To provide easy electronic access for Belgium authorities to information on formal workers, helping them to identify informal workers.

Description: The Declaration of Works (DoW), introduced in March 2012, and Checkin@Work (C@W), introduced from April 2014, are electronic registers that record the chain of (sub)contractors in the construction sector in Belgium in order to combat informality within the chain of (sub)contractors.

The **Declaration of Works** is an electronic declaration of work, submitted to the National Social Security Office (NSSO) by the main contractor before the commencement of the work. The contractor must declare all information associated with the construction site, contractors and subcontractors to the NSSO (small assignments with a total value of less than €30,000 are exempt). The main contractor is also responsible for declaring any changes made to the main contract. The information to be declared must include: start/end of the work on the construction site; start/end of activities of each contractor and subcontractor; identification of each contractor & subcontractor; and description of the works.

The employer must ensure direct payments are made to ensure social security for workers. The Declaration of Works enables the NSSO to trigger the mechanism of liability for company debts if no deduction is made. For non-declaration of works by contractors and/or subcontractors in the construction-specific system, liability commences immediately. If the non-declaration is due to an administrative error, there is a penalty of 5% of the total value of the work. For subcontractors with social security debts, the main contractor must check the status of the subcontractor before each outstanding invoice. Subcontractors with social security debts are registered on the social security portal (www.socialsecurity.be). If the subcontractor has social security debts, the contractor must deduct 35% on each payment by the subcontractor and transfer the amount to the NSSO. The money will be used to pay the outstanding social security contributions.

Checkin@Work is an online service for the registration of workers in the construction and meat processing industries. In the construction sector, it helps tackle fraud by showing who is present on a construction site, when and for whom the work is carried out, and under which status (employee or self-employed). This enables targeted inspections to be made. The following data must be recorded for all works on construction sites with a total value of €500,000 or more: identification of the worker; address of the construction site; capacity in which the person carries out his activities (employee, self-employed, project supervisor, employers, coordinator etc.); identification of the employer or of the person by who has ordered the work to be carried out; identification number of the declaration of work; time of recording. Data can be entered online, for example, using a laptop or a smartphone, making the information easily accessible. The database is managed by the NSSO.

Evaluation: No evaluations have been carried out. However, the NSSO believes these e-registers have reduced informality on large-scale construction sites. High-risk sites and contractors can now be targeted for effective inspections. The success of the databases can also be measured by the interest other sectors have shown in adopting a similar model for themselves, such as security services and meat processing.

Source: https://ec.europa.eu/social/BlobServlet?docId=18322&langId=en

In many European countries, there has also been the introduction of smart Identity Cards to improve the probability of detection of informal workers, especially in the construction industry (for a review, see Briganti et al., 2015). Box 6 reports on the example of the Valtti-card in Finland.

▶ Box 6. Valtti-card, Finland

Aim: To identify people and employers working on the construction site and to ensure that all workers are registered workers, a photo identity card and smart card (Valtti-card) was introduced in 2013.

Description: All individuals working on shared building sites in Finland are required to wear name tags with photo and tax numbers and keep them visible. The tags must be kept visible for example on helmet or clothes. The main contractor supervises that workers wear the tag. They have to control name, photo and tax number before the workers enter the construction site. With the National ID card or the passport, the tax number can be checked online from the taxpayer database of the Tax Administration. The main contractor and the employer are both responsible for the data and the registration. The Valtti-card service has also enabled the development of a centralized competence register. On the Valtti-älykortti, the card provider can add more electronic data than required by law, such as work permit or license to work with asbestos. The information can be updated by the employer or sometimes it is collected directly from the authority's database. In that case the data can be updated monthly and the main contractor can rely on it.

Valtti-älykortti can be used with different electronic measures (gates, special machines and cellphones). Evidence shows that the main constructors use more and more electronic gates (closed construction sites and electronically control access) and "stamping machines" to ensure every person is signed "in" and "out". By using Valtti ID-cards, the employee can add more information on the card and used as an electronic key to the construction site. It can have data about the worker's skills too.

Evaluation: The service is paid for by operators of the construction industry themselves. The price is moderate at €24 plus VAT per card. The tax authority has verified that in the first 18 months (after September 2012) when it was introduced, tax revenues increased almost €500 million. For example salary payments increased in January 2014 almost 9% compared with January 2013. In the same time period, construction business had been decreasing. This shows that the card is effective. The introduction led to a decrease of informal work because the construction companies are more aware of who is working on their construction sites.

Sources: https://ec.europa.eu/social/BlobServlet?docId=19453&langId=en
https://www.veronumero.fi/henkilokortit/
https://www.tilaajavastuu.fi/wp-content/uploads/2016/02/Valtti-card.pdf
http://blogi.tilaajavastuu.fi/mika-ihmeen-Valtti-card

Besides e-registers and smart ID cards, other e-initiatives to collect data to improve the detection of non-compliance, including the informal economy, include:

- shifting case management databases of audit/ inspection outcomes from paper-based to electronic forms that can be merged with other electronic databases, are up-to-date and fully accessible to those who need them;
- "web scraping" to collect data on specific businesses or individuals;
- collecting "third party" data, including:
  - individual or business bank account information from banks;
  - information from telecommunications providers on individual businesses or employees, or
  - information on internet service providers (ISPs) on the activity of businesses or employees. That is, two types of data can be collected by an enforcement authority to detect informal work:
- Internal data: data originating from the enforcement body itself or available within the administration in which the enforcement body is located, and
- External data: data obtained by the enforcement body from other administrations or from other public or private sources.

This requires the **sharing of data** by and with other bodies, especially administrative data from and with other authorities. However, access to these data is not always an easy task. If data is to be shared electronically, it requires:

- a cross-government information technology infrastructure that actively supports the implementation of standardized processes. Electronic systems are often not compatible with each other. The design and the architecture of the information technology infrastructure therefore needs to be compatible cross-government, to reflect the operational needs of the enforcement bodies and be capable of being updated without prohibitively high effort and cost.
- that legislation to protect personal data and safeguard privacy do not hinder or limit data exchange or the use of the data. Data protection and data security need to be built into the system from the very start using privacy by design, or its variation "data protection by design".
- "political will" in enforcement authorities to share data with each other.

In most European countries, there is the lack of a fully coordination approach to data sharing. Many enforcement authorities have difficulties in accessing data from other enforcement authorities. Box 7 provides a solution developed in Belgium to the problem of authorities gaining access to information from other institutions.

▶ Box 7. The Crossroads Bank for Social Security (CBSS), Belgium

Aim: The Crossroads Bank for Social Security (CBSS) provides a gateway to improve service delivery to socially insured people and the companies involved. Social benefits are automatically granted without citizens or their employers having to make declarations. The administrative burden for citizens and companies has been drastically reduced.

Description: Social security in Belgium consists of three insurance systems (workers, self-employed workers and civil servants), that cover maximum seven social risks (incapacity for work, industrial accident, occupational disease, unemployment, old age, child care and holiday pay - the so-called branches of social security), and four assistance systems (subsidies for the handicapped, guaranteed family allowance, minimum income and income guarantee for the elderly), that grant people specific minimum services after checking their subsistence resources. In total about 3,000 institutions are responsible for the execution of the Belgian social security.

The Crossroads Bank for Social Security (CBSS) is a gateway for data from 14 social security institutions and offers electronic services for citizens. The CBSS, despite its name, is not itself a databank; it is a network for data flows from different institutions. Each institution holds its own data, are the authentic source of the data and there are conventions about the treatment of the data. The CBSS initiative started in the early 1990s and has been developing ever since. The legislative changes needed for the CBSS to be created included the legal translation of a common vision on information management and on information security and privacy protection and the obligation for each institution participating in the CBSS to use unique identification keys for their data.

Evaluation: In 2016 some 1.1 billion electronic data exchanges took place with a response time for the online messages of less than 4 seconds in 99.27 % of the cases. The advantages of creating this system include efficiency gains. The Belgian Planning Bureau calculated that the information exchange processes implied an annual saving of €1.7 billion per year. The CBSS made possible the provision of services of better quality and new types of services, such as automated granting of subsidies.

Critical success factors included a common vision on electronic service delivery, support by policy makers at the highest level, the trust of all stakeholders, and respect for the legal allocation of competences. This top-level political support and the gradual involvement of the general managers of all public social security institutions, the social partners, and the general managers of the private social security institutions was significant. Finally, it was important to ensure that electronic service delivery included a multi-disciplinary approach including legal, ICT, communication, coaching, training and change management.

Source: www.ksz-bcss.fgov.be/nl/information-english

Moreover, some European countries have decided to adopt a fully coordinated cross-government approach with one central unit collating the various datasets and acting as a warehouse for all relevant authorities. Box 8 provides a case study of how Finland have overcome the traditional problems with sharing data by creating one central unit for all government ministries involved in tackling informality.

▶ Box 8. Grey Economy Information Unit (GEIU), Finland

Aim: To join up the previously fragmented function of data analysis and transcend the need for data sharing by establishing one central unit to produce and share information on informality to all interested public bodies.

Description: The Grey Economy Information Unit (GEIU) was established in 2011. It produces and shares information on informality. Through its service, the unit provides a single point of access for permitted public authorities to gain information on organizations and individuals within organizations suspected of engaging in informality. The GEIU is responsible for gathering and disseminating information on the grey economy. The authorities permitted to request compliance investigations are defined in the enacting legislation, as are the purposes for which a compliance report can be prepared. The GEIU produces three types of report:

- Compliance reports: Investigate specific organizations and persons suspected of engaging in informality at the request of public bodies. The report describes the operations and finances of an organization or an associated person and the management of obligations related to taxes, statutory pension, accident or unemployment insurance contributions, or the fees charged by Finnish Customs. During 2015, the GEIU prepared a total of 202,184 compliance reports.
- Classification reports: These are highly standardized anonymous reports. Some 100 classification reports are published every year (for instance, restaurants in a specific geographical area).
- Grey economy reports: Some 10 to 15 reports every year mainly interesting for policy makers.

The service is fully automated with a full web interface, meaning that compliance reports are produced automatically and delivered to the information system of the requesting authority. The GEIU does not charge for the preparation of reports. It is also entitled to obtain, free of charge, the information it needs to prepare the reports. There are 24 employees.

Evaluation: The GEIU has produced 2 million compliance reports since it was established in 2011. From receipt of a request for a compliance report, it takes the GEIU about one day to complete. Currently 21 authorities have permission to request compliance reports from the GEIU. The public website content is produced in collaboration with 21 authorities and ministries involved in three languages including Finnish, English and Swedish. This provides statistical information on the impacts of action taken against informality, as well as providing companies and citizens with information on how to act or protect themselves against such harm.

Source: https://ec.europa.eu/social/BlobServlet?docId=18511&langId=en

Once data is collected and shared, **data analysis** is required to detect informality. Data analysis takes two forms:

- **Data matching** - the large-scale comparison of records or files collected or held for different purposes, with a view to identifying potential instances of informality, and
- **Data mining** - a set of automated techniques used to extract buried or previously unknown pieces of information from large databases. Correlations or patterns among dozens of fields in large relational databases are identified. Two approaches can be used. Deduction begins with an expected pattern/theory/hypothesis that is tested. Induction begins with the observations/data and seeks patterns within them, and theories proposed resulting from the observations.

Most authorities across Europe focus their efforts on data matching, but there is growing interest in data mining, especially in tax authorities. Although some countries have a fully coordinated cross-government approach to data analysis, with a central unit providing a common data analysis function on detecting

informality to all relevant authorities (e.g., the GEIU in Finland as described in Box 8), this is exceptional. In most European countries, data analysis is conducted at the level of the different administrative authorities. For this to be effective in detecting and preventing informality, there is a need for:

- Up-to-date data to be available.
- The databases containing the data to be inter-operable.
- Specialised staff who can administer and produce intelligence using data mining and matching (see ILO, 2013).
- A well-functioning data analysis tool.
- Resources to be available to fund such analysis, which requires "proof of concept" in terms of the "returns on investment".
- Such analyses to be made easily available to inspectors to help them in the field detect and prevent undeclared work.

Given the wide number of applications of data mining, many data mining tools are available either as open-source or commercial software (for reviews, see Altalhi Abdulrahman et al., 2017; European Platform tackling undeclared work, 2017b, 2018b; Mikut and Reischl, 2011; Rangra and Bansal, 2014). Examining the **analysis process**, the primary challenge is to build a model that accurately predicts whether a business or worker is compliant. Examples of data-mining techniques include:

- **Decision trees**: this technique identifies groups of individuals or businesses that are as homogeneous as possible based on a set of predefined variables. It is based on an algorithm using separation criteria to identify the groups;
- **Neural networks**: this technique is similar to decision trees in the sense that it seeks to identify homogeneous groups based on a set of variables and criteria. However, because it does not require a hierarchy in the variables it is more powerful; and
- **Clustering**: this is another segmentation technique that allows for the simultaneous analysis of several possible explanatory variables during the segmentation process (Khwaja et al. 2011).

Based on these techniques, the objective is to detect anomalies to the norm, or **outliers**. An example from the UK is that in the hotel sector turnover to credit card transaction ratios are used by the tax authorities to identify outlier hotels where turnover to total credit card transactions deviate from the norm. This **dynamic benchmarking** of the hotel sector occurs on a city level and for types of accommodation provider (e.g., small hotels), since credit card to turnover ratios are higher in cities and larger hotels than in smaller hotels and in smaller towns. A too high share of payments by credit cards in total declared turnover, in comparison to the benchmark determined for the specific area, results in an alarm/red flag. This data mining initiative has required third party data from banks on credit card transactions, which were compared with reported turnover on tax returns, to identify "outlier" hotels who deviate from the norm. Notification letters can be then sent to these businesses notifying them of the discrepancy identified and the need to put their affairs in order. This could be similarly applied in many other sectors and occupations (e.g., restaurants, tour guides, tour operators).

Machine learning provides methods, techniques and tools which help to learn automatically and to make accurate predictions based on past observations. For instance, the Federal Public Service (FPS) Social Security in Belgium uses machine learning to detect differences between employers. Based on the outcome of previous audits, the characteristics of employers who have used informal work previously are compared with the characteristics of employers who have made no infringements. By the application of machine learning, employers are then ranked by their vulnerability to fraud. The reason why the employer is considered vulnerable to fraud will also be clear for the inspector (i.e., red flag for a certain alarm).

Convinced that fraudsters are often connected to each other (for example, via the same accountant, managing directors, clients, suppliers, etc.) or that they may have many things in common with other fraudsters, the FPS Social Security Belgium has also recently started network analytics to rank and profile cases. This application of **network analytics** follows its earlier successful application to tackle VAT carousel fraud. The Swedish tax administration also reported that they not only look at the company but also at its network.

The HMRC (Her Majesty's Revenue and Customs) in the UK applies predictive analytics to identify high risk VAT traders. Data is taken from the VAT population (returns, debt information, trader characteristics and audit visit outcomes). A behaviour model is used to identify behaviour based on logistic regression analysis.[13]

Box 9 provides a good practice example from Belgium of a data analytics tool, namely MiningWatch.

▶ Box 9. MiningWatch data analytics tool, Belgium

Aim: MiningWatch is a data mining tool which uses predictive modelling to define fraud risks in three different sectors: construction, cleaning and the hotels and catering sector. The aim is to improve the effectiveness of detection of informality using predictive modelling to support inspectors in choosing inspection targets.

Description: Launched in January 2015, there are over 60 predictive automated models that run. Based on the MiningWatch predictive models, search results rank companies according to their risk level: red (high), orange (elevated), green (medium), and blue (low). MiningWatch can calculate a score for an employer based on data mining and prepares a score card with five variables, listed below in order of importance:

- Strong personnel turnover
- Few recent declarations in the DIMONA system (i.e., an electronic system all employers are required to use to register a new employee with the National Office for Social Security)
- Low business turnover
- Tax variables such as VAT debts
- Not declaring client listings.

This analytical tool supports inspectors to choose and target their inspections based on the predictive risk modelling. The core team consists of 10 staff members: analysts, IT staff and inspectors with specific training in the use of the tools. In addition, another 50 staff members are involved in the implementation of MiningWatch. A task force of inspectors was set up to verify the accuracy and effectiveness of the predictive models which are defined by the core team. The characteristics of each predictive model are presented to expert inspectors and their feedback is requested. This process is repeated until the characteristics from a risk profile are accepted by inspectors. The model is then monitored to see if the profile stays predictive.

Indeed, feedback takes three forms. Feedback is collected in the short-term immediately after inspection, in the medium-term such as the confirmation of fraud type X or Y when an inspection case concludes, and in the long-term after combining cases over time or across networks such as verdicts of legal cases, the proportion of the contributions actually collected etc. A distinction is made between inspectors who are "power users" who will make good use of the wealth of data available, "casual users" who will use it but not further it, and "anti-users" who are non-believers in data mining. The number of anti-users has been declining over the 15 years since its introduction, largely due to the positive results arising from the use of MiningWatch.

Evaluation: The annual costs amount to €200,000 including software licence and service provider costs. Detection rates have increased with average detection rates rising from a 16% success rate prior to MiningWatch to 45% using MiningWatch.

Source: http://ec.europa.eu/social/BlobServ- let?docId=18372&langId=en

13 Logistic regression is used to describe data and to explain the relationship between one dependent binary variable (e.g., non-compliance) and one or more nominal, ordinal, interval or ratio-level independent variables.

Such e-initiatives based on data collection, sharing and analysis require significant resources both in terms of the costs of acquiring data, the costs of staff to conduct data analysis and the investment in technology. It is therefore important to assess the "return on investment". One of the few revenue-to-cost figures in the public domain comes from the UK (see Box 10).

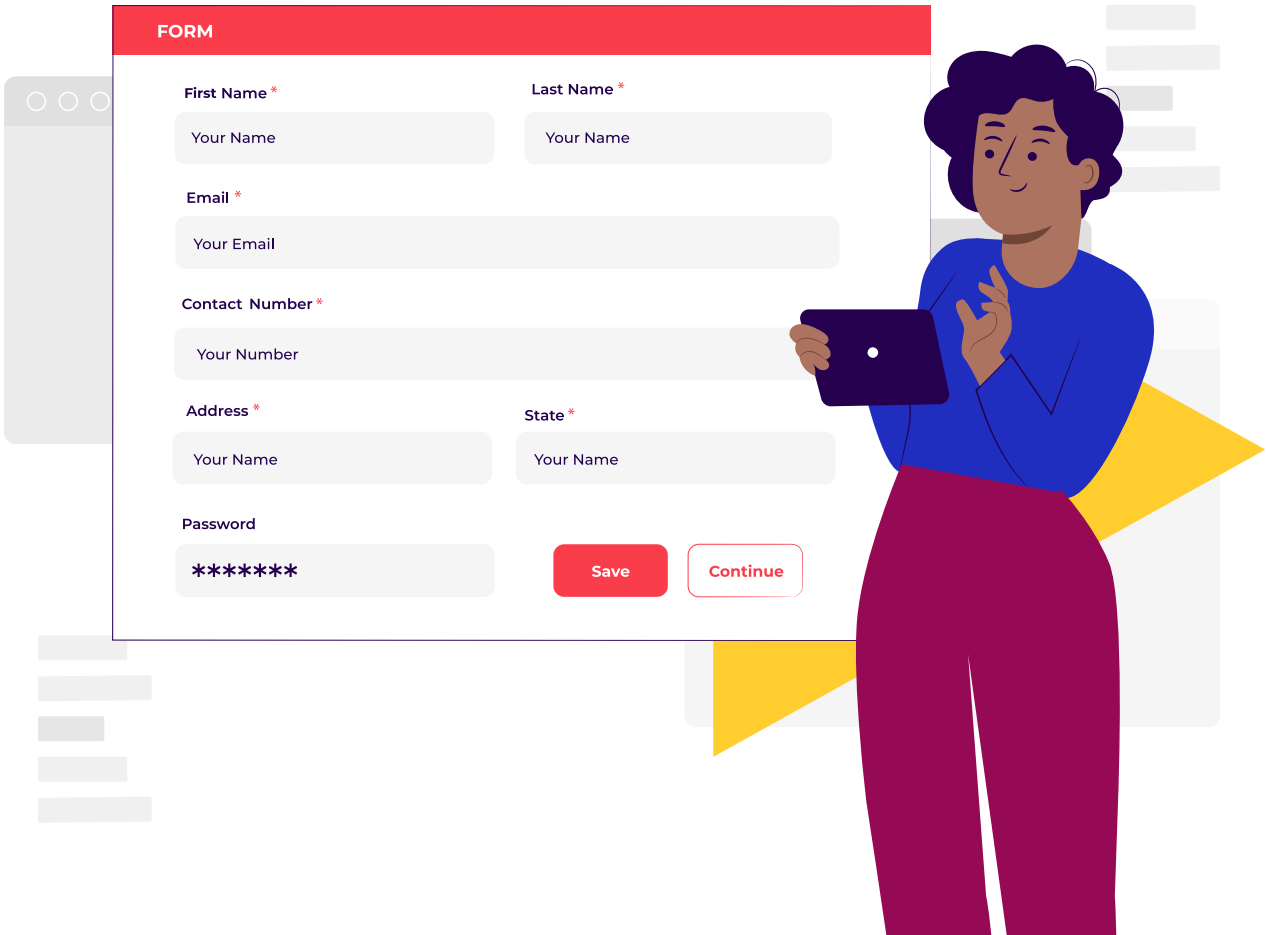
▶ Box 10. Revenue-to-cost ratios of developing data analysis tools: the case of the Connect tool of Her Majesty's Revenue and Customs (HMRC), United Kingdom

Aim: The aim of the Connect data system is to improve the rate of detection of informality using advanced data matching and mining.

Description: Her Majesty's Revenue and Customs (HMRC) in the UK launched Connect, one of its main analytical tools, in 2010. It ingests over three billion data items and looks towards matching them and producing connected entities. In total, it brings together 40 data sets with 22 billion lines of data and 600 million documents. There are some 250 data analysts and 4,000 users of the Connect tool, and there have been 13 million searches. The tool uses information from all HMRC data systems related to tax declarations for self-employed individuals, employees and employers, companies and business, property and land taxes, and indirect and consumption taxes and makes connections between the data to identify all data related to individuals and businesses. In this way HMRC can gain a comprehensive picture of its taxpayers and the data (HMRC and third-party data) relating to them.

Evaluation: Evaluating the revenue-to-cost ratio, HMRC report that the additional tax identified by *Connect* is far greater than the cost of the data mining tool. HMRC have spent £90 million on developing this system, but until now, it has helped secure an additional £3 billion in tax revenues (a 30 to 1 revenue-to-cost ratio). More than 7 out of 10 enquiry case selections are generated by *Connect*.

Source: http://ec.europa.eu/social/BlobServ- let?docId=18525&langId=en



3.1.2. Electronic complaint reporting tools

Another e-initiative to improve detection of informality relates to the provision of online complaint reporting tools.[14] A 2018 survey of members of the European Platform tackling undeclared work revealed that 82% of authorities had complaint reporting tools. The majority (81% or 31) have a website available and 68% also an email address. 58% also have a postal address for sending letters (58% or 22) and 55% a telephone hotline. Only 71% of these tools use a risk assessment or sifting process for complaints received. For 24% of the complaint reporting tools, all complaints reported lead to inspections (Williams and Puts, 2018).

Box 11 provides an example of the online complaint reporting hotline of the Hellenic Labour Inspectorate (SEPE) in Greece.

▶ Box 11. Online complaint reporting to the labour inspectorate, Greece

Aim: to improve the effectiveness of inspections by enabling the public to report complaints of informality.

Description: In 2011, a telephone complaint helpline was introduced with a 5-digit line, 15512, to receive complaints (mostly anonymous) related to labour law violations, which were forwarded to regional and local inspectorates for investigation. In 2015, the telephone call centre (https://www.sepenet.gr/liferayportal/archike) became a Multimedia Communication Centre (MCC) expanding the range of channels through which complaints could be reported (i.e., email, fax, SMS) and providing automated information and advice to the public using scripted language responses.

Evaluation: 3 inspectors staff the platform. All messages are followed up. The most used channel is email. However, the use of risk assessment to sift the complaints needs improvement.

3.1.3. Data-driven notification letters

One outcome of using e-registers to collect data, data sharing and data analytical tools is that enforcement authorities have experimented with alternatives to the workplace inspection. One notable example is the use of data-driven notification letters.

Notification letters are postal or email communications from enforcement agencies to companies or workers, giving information on applicable legal obligations and systems of control in place. Although these have been widely applied in tax compliance (Beeby, 2017; Hasseldine et al., 2007), notification letters have also recently been used by labour inspectorates (see Williams, 2019b).

Box 12 provides an Estonian case study of how data mining by the tax authority led to the identification of businesses to whom notification letters were then sent to the employers and employees, resulting in a reduction of wage under-reporting.

14 For further information on these online complaint reporting tools in all EU countries, see https://ec.europa.eu/social/main.jsp?catId=1417&langId=en

▶ Box 12. Reducing wage under-reporting using data-driven notification letters, Estonia

Aim: To identify "outlier" employers and employees using data mining followed up by notification letters to reduce envelope wages and increase tax revenues.

Description: In January 2008, the Estonian Tax and Customs Board identified using data mining 1,000 businesses with low wage levels compared to the average level in their region and respective business sector, which might suggest the payment of envelope wages. They then sent notification letters to these 1,000 companies and 2,000 employees. Letters were sent either to employees only, employers only or both employers and employees of the same company. These notification letters informed the employers of the low competitiveness of their wage levels compared with average wage levels. Employees were informed of the risks that accompany envelope wages such as losing social guarantees. The intention was to provide employers with the opportunity to change their behaviour before receiving penalties. It also aimed to raise awareness about the impacts of paying envelope wages among both employers and employees to change employers' and employees' attitudes towards under-declared employment.

***Evaluation*:** 46% of the companies receiving these letters adjusted their wage levels and increased their tax payments. After four months, the notification letters had brought an additional EEK 10 million (c.€640,000) of tax income, including EEK 8.8 million (€562,000) from notifications sent to enterprises and EEK 1.2 million (€76,600) from those sent to individual employees. Comparing different methods of sending notification letters, the most successful in terms of improved tax behaviour was when both the employer and the employees received letters; 56% of such enterprises improved their tax behaviour. Given that the Estonian Tax and Customs Board at the time conducted 2,000 inspections per annum, and these notification letters resulted in just less than 500 enterprises improving their tax behaviour, this provides a cheap and relatively effective additional measure that can be implemented to reduce under-declared employment.

Sources: Williams (2014).

Box 13 provides a Lithuanian case study of how data mining by the tax, labour and social insurance authorities led to the identification of businesses to whom data-driven notification ("nudge") letters were then sent, resulting in a reduction of wage under-reporting.

▶ Box 13. "Warned to choose" and "cherry letters" in Lithuania

"Warned to Choose" model

The State Tax Inspectorate (STI), in cooperation with the State Labour Inspectorate (SLI) and the State Social Insurance Fund Board (SSIFB), sought to reduce risks related to non-recording of all hours worked by employees and payment of a part of wage/salary in envelopes. In 2015 to 2016, 40,000 risky taxpayers, selected through a comparison of the databases of the SLI, STI and the SSIFB, were sent warning letters. Companies were informed that wages paid for their employees are significantly lower compared to other companies operating in that sector and/or region.

Outcomes: As a result of the 40,000 letters sent in 2015, average wages increased by 15-17% in 2016 compared with 2015, €68 million was paid in extra wages and €27 million extra tax was collected.

▶ **Box 13. (cont.)**

Cherry letters initiative

In May 2017, the Social Security authority (SODRA) sent 138,000 "cherry letters" to employees, of which 132,000 reached the recipient. The main purpose was to report to them that as an employee in the last year, they did not accumulate one year of pension contributions because it is likely that they were involved in undeclared or under-declared work. Among the recipients of "cherry letters" were 13,000 heads of companies and administration, 23,000 engineers, specialists and technicians, 37,000 skilled workers and 30,000 unskilled workers.

Outcomes: The income of 50,000 employees who received the "cherry letters" grew and their salary exceeded the minimum monthly salary. SODRA earned €17 million more social security contributions over four months. The average salary reported increased by 55%.

Sources: https://ec.europa.eu/social/BlobServlet?docId=18698&langId=en
https://ec.europa.eu/social/BlobServlet?docId=21776&langId=en

In Spain, meanwhile, 81,639 data-driven notification letters were sent to companies identified to employ workers on a temporary basis or to have more than 30% of the workforce on part-time contracts (no more than 12 hours per week). As result, 61,445 fixed-term contracts were transformed into open-ended contracts (76.3% of the workers) and of the companies contacted about part-time workers, 8,824 part-time workers witnessed an increase in their working hours (17.5% of the workers). [15] Overall, therefore, the finding is that the use of data mining to select risky businesses to whom notification letters are sent is a powerful tool and results in a significant increase in the number of new contracts, of working hours and/or wages, and consequent increase in social contribution payments. Box 14 provides an evaluation of their use in Greece.

▶ **Box 14. An evidence-based evaluation of the use of data-driven notification letters to change employers' behaviour in Greece**

Between December 2018 and June 2019, the Hellenic Labour Inspectorate conducted an evidence-based evaluation of the impact of using nudge letters in four regional departments. Using the ERGANI database risk analysis tool, 2,434 businesses in two sectors (cafes/restaurants and hair/beauty) were subject to either: a gentle nudge letter; a strong nudge letter; an announced inspection letter, or an unannounced inspection.

Outcomes: To evaluate the impact, the ERGANI employment records system was used to assess whether the employers receiving each type of letter has altered their records on full-time and part-time employees, working hours, and overtime. The analysis showed that personalised strong nudge e-mails were more effective than un-personalised gentle nudge emails. Announced inspection letters resulted in an increase of 30.95% in full-time contracts in the first month after the letter was sent, compared with 5.74% in the control group.

Source: https://ec.europa.eu/social/BlobServlet?docId=21429&langId=en

15 https://ec.europa.eu/social/BlobServlet?docId=20241&langId=en

3.1.4. Certified cash registers

Another e-initiative to deter informality is the use of certified cash registers (Williams, 2014). A certified cash register consists of two parts: a cash register with a manufacturer declaration and a special control unit, a black box, connected to the cash register. The black box reads registrations made by the cash register. Certified cash registers not only reduce non-declaration of turnover but also reduce the amount of cash available to businesses to pay envelope wages.

Certified cash registers have been introduced in many EU member states. For example, since 2010 in Sweden, businesses selling goods and services in return for cash payments must have a certified cash register. Only the Swedish Tax Agency can access the data in the black box. In Sweden, the businesses bear the costs of the cash registers, which totals some SEK 15,000 (€1,785). Companies not complying are fined SEK 10,000 (€1,190) by the Swedish Tax Agency. If the company once again fails to comply with the law within a year, a fee of SEK 20,000 (€23,800) is charged. Cash payments also include payment by debit (bank) card and it is mandatory for the trader to give the customer a receipt. The tax agency conducts unannounced "undercover" visits to see if all transactions go through the register and that receipts are given. Failure to issue receipts or register transactions can result in the trader being fined and lead to a full audit.

3.2. Improving sanctions

Another way of increasing the costs of participation in informal work is to improve the penalties for those caught with the objective of either preventing participation in the informal economy and/or formalizing the informal economy. E-initiatives are important means of facilitating the improvement of sanction systems.

For example, in Greece, due to the advent of a real-time e-register of employment, it has been possible to develop a novel penalty system that facilitates the formalization of the informal economy. In 2017, the fine for employers using informal workers was set at €10,500 per informal employee. However, the employer can hire within 10 days the informal employee as a registered formal employee to decrease the fine by the following amounts: €7,000 if they hire the employee for 3 months; €5,000 if they hire the employee for 6 months, and €3,000 if they hire the employee for 12 months. This sanctions system is only possible because the employment of these employees can be monitored on the ERGANI e-register of employment. Before the e-register, such a sanctions system would not have been possible. The outcomes are impressive. In 2017 before the new sanctions system, only 32% of detected informal workers were subsequently hired on a formal basis by the employer (two-thirds on a part-time basis and only one-third full-time). For the period August 2018 - February 2019, after introducing the new sanctions system, 45% of detected informal employees have been hired by the employer, all of them on a full-time basis. Of those hired formally, 91% have been hired for 12 months, 3% for 6 months, and 6% for 3 months.[16]

E-registers and case management databases can also be used to implement other types of sanctions, such as **non-compliance lists** where the businesses on them are for example excluded from bidding for public procurement contracts or receiving subsides. One present-day example is the proposal that farm enterprises should be excluded from Common Agricultural Policy (CAP) subsidies if they violate workers' rights and engage in informal work practices.[17] Such non-compliance lists are dependent on having up-to-date data on accessible databases.

An alternative to a non-compliance list is a "**compliance list**" composed of businesses with no tax, labour or social security law sanction against them in the recent past. An example of a type of compliance list is the aggregate tax behaviour rating of businesses maintained by the Estonian Tax and Customs Board (ETCB).[18] The aggregate tax behaviour rating consists of five indicators (i.e., tax arrears, declarations filed on time, current penalties for tax or customs related offences, tax

16 https://ec.europa.eu/social/BlobServlet?docId=22206&langId=en
17 https://www.etuc.org/en/document/joint-letter-new-cap-needs-social-conditionality; https://effat.org/in-the-spotlight/press-release-open-letter-the-new-cap-needs-social-conditionality/
18 https://www.emta.ee/eng/businesses-can-view-ratings-their-tax-compliance-etcbs-e-portal

proceedings conducted in relation to the company and the background of the management board member). The rating given to a business influences the likelihood of inspection and when made public, enables businesses to decide which sub-contractors to use. E-initiatives to develop up-to-date datasets are an essential precursor for the use of such non-compliance and compliance lists.

3.3. Improving the ease and benefits of operating formally

Besides increasing the actual and/or perceived costs of operating in the informal economy, governments can also increase the benefits of operating in the formal economy. *Formalization incentive measures* make it easier and beneficial to be compliant. They are of two types:

- Supply-side incentives to make it easier and/or more beneficial for businesses and workers to operate in the formal economy, and
- Demand-side incentives targeting their customers with rewards for using formal goods and services.

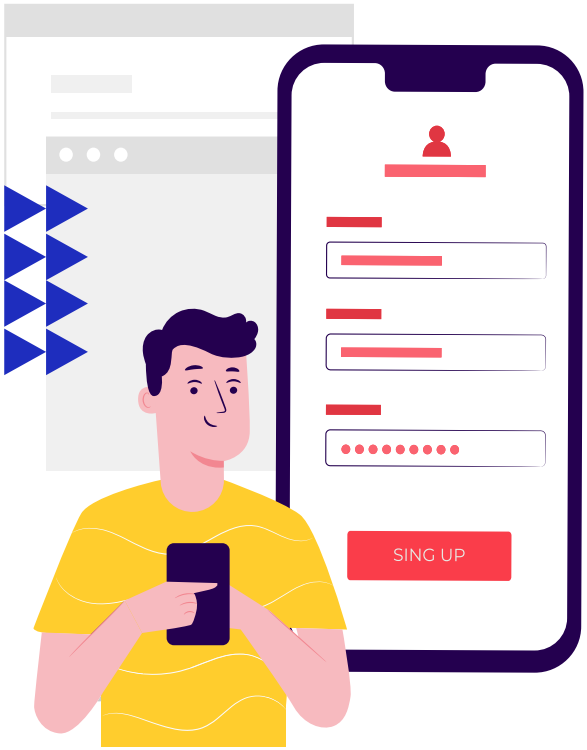
Here, each is examined in turn.

3.3.1. E-initiatives to makes it easier and/or beneficial to operate formally

Simplifying compliance is important because not only does complexity increase the likelihood of misreporting (Alstadsæter and Jacob, 2013), but also when the costs of full administrative compliance are higher, compliance rates are lower (Adams and Webley, 2001; Matthews and Lloyd-Williams, 2001). Indeed, examining 45 economies, Richardson (2006) reveals that regulatory complexity is the most important determinant of non-compliance. The lower the level of regulatory complexity, the greater is the level of compliance.

In Europe, there have a multitude of e-initiatives to simplify compliance. Beyond the above discussed e-registers which simplify the registration of employment and are capable of automatically paying benefits, there have been numerous e-initiatives to **simplify business registration**, such as virtual one-stop shops and electronic registration services, which reduce the time-consuming procedures and increase compliance. Importantly, these initiatives join-up government by putting in one place the various obligations of different institutions. According to the 2020 World Bank Doing Business Survey, electronic services to register businesses are available in more than 90% of high-income economies, in contrast to only about 40% of low-income ones.[19]

An example is the e-business register in Estonia which provides a platform for registering businesses online without the need for a notary or other officials. Greece, however, has the simplest business start-up procedures in Europe according to the 2020 World Bank Doing Business Survey (see Box 15).



19 https://www.doingbusiness.org/en/data/exploretopics/starting-a-business/good-practices

▶ Box 15. E-registration for business start-ups in Greece

Greece has overtime moved towards electronic services to register a business. In 2018, the online company registration portal was made accessible to the public. An entrepreneur can access the portal using an electronic ID or personal access code from the tax authority and register a business without leaving the office or exchanging any paperwork. Registration fees are 30% lower for those who use the online service.

In Greece, starting a business anywhere in the country requires the same fees and the same three procedures, which take three or four days to complete and pay the equivalent of 1.5% of income per capita, less than half the EU average. For €250 (or 30% less if done online) entrepreneurs can register directly with the commercial registry without having to hire professional intermediaries. By law, the minimum amount to be deposited in cash, before incorporation, as paid-in capital, is a symbolic €1.

The process was not previously so easy. Starting a business in Greece used to require visiting several government offices, completing 15 procedures, filling out numerous forms, waiting more than a month and paying fees totalling more than 20% of income per capita. To register their companies, Greek entrepreneurs also had to make a bank deposit equal to more than 100% of income per capita. This started to change in 2008, with Law 3661/2008, which reduced the minimum capital requirement and shortened the time needed for publication of the incorporation announcement for limited liability companies. The registration process was further streamlined in April 2011, when Greece implemented an electronic platform (G.E.MI.) connecting several government agencies. One year later, Law 4072/2012 introduced a new, simpler and more flexible corporate form—the Private Company (IKE)—with a paid-in minimum capital requirement of only €1. Registration costs were lowered again in 2014. In addition, enhanced information-sharing between the Tax Authority and the Chamber of Commerce eliminated the requirement for entrepreneurs to obtain a separate tax clearance in 2016. Chamber of Commerce officials can now check directly with the tax authority to determine whether company founders have outstanding taxes to pay at the time of registration.

Source: World Bank (2019) *Doing Business in the European Union 2020: Greece, Ireland and Italy*. Washington, DC: World Bank.

It is not only online portals to register businesses, however, that can simplify compliance. There are also online portals to register and pay taxes and social contributions. These too can simplify compliance such as by **pre-filling tax returns**. Denmark was the first economy to pre-populate tax returns in 1998. Since then, pre-filling has become a significant component of the e-services and e-government strategy of many tax authorities (Jensen and Wöhlbier, 2012). Pre-filling involves tax administrations using information available to them (e.g., third-party reports of labour and savings income, using wage data from employers, positive and negative interest income, dividends and returns on shares) to populate fields on tax returns, which are then made available to taxpayers to complete and validate.

In the Nordic nations for example, tax administrations produce fully completed personal income tax returns for most taxpayers required to file tax returns (OECD, 2011). Substantial pre-filling of tax returns also occurs in Belgium, Estonia, France, Lithuania, Malta, the Netherlands, Portugal, Slovenia and Spain. The overarching intention is to reduce fraud and error on tax returns, and to make it easier for taxpayers to comply and pay their taxes.

Evaluating its effectiveness, Kleven et al. (2011) in Denmark find that while over 90% of all personal income can be pre-filled on tax returns using reports by third parties, for the self-employed less than 10% of their income can be pre-filled on tax returns from reports by third parties. The result is that while only 2% of individuals receiving personal earnings (e.g., wages, transfers) report too low incomes, and just over 4% of those with deductions, tax non-compliance prevails for 40% of individuals with self-employment income. As such, pre-filling tax returns is a potentially useful method for simplifying compliance to reduce fraud and error, as well as making it easier for taxpayers to comply. Box 16 provides an example from Estonia.

▶ Box 16. E-tax in Estonia

First introduced in 2000, e-Tax enables the online declaration of tax. Operated by the Estonian Tax and Customs Board (ETCB), any taxpayer can file their tax return online and much of it is pre-filled. On average, it now takes taxpayers an average of 3 minutes to complete. This e-tax covers not only individual income tax returns but also companies can declare income tax, social tax, unemployment insurance and pension fund contributions through e-Tax (Government of Estonia, 2020). A significant incentive to persuade taxpayers to file their taxes online was the quick refund of money if they had overpaid. Rather than filing a paper application which could take weeks to process and distribute a refund, electronic filing of tax declarations meant a refund waiting period of 5 days. The users of e-Tax increased consistently from 59% in 2004, to 92.4% in 2010, to 95% in 2015 (Ströbele et al., 2017). By 2019, approximately 98% of tax declarations are completed online.

Source: Divald (2021).

A further e-initiative to simplify compliance is to allow smaller jobs currently conducted in the informal economy, often out of necessity because of the complex compliance required to declare them, to move into the formal realm by introducing online simplified registration. Box 17 reports an example of online simplified registration system for seasonal and causal work in Hungary.

▶ Box 17. Online simplified registration of seasonal and casual work, Hungary

The *2010 Simplified Employment Act (Egyszerűsített foglalkoztatási törvény)* in Hungary was introduced to make it easier for seasonal and temporary employment to be conducted in the formal economy. Before this Act, employers had to complete in duplicate an official attendance sheet with 18 pieces of information for every seasonal worker in a "Temporary Work Booklet". This booklet was a breeding ground for labour infringements because employers engaged in the erasing and rewriting of contracts, such as by using special inks that could be erased using heat on the paper.

From 2010, the Simplified Employment Act introduced electronic registration stating the exact data and time of registration. Since 2017, a mobile app has been used. This enables the simplified work contract to be notified either by: a short message service (SMS) or electronically via the Client Gate System after they are registered and in the system (https://regi.ugyfelkapu.magyarorszag.hu/). All obligations are fulfilled by entering two codes into the text message or into the Client Gate System, namely notification, reporting and payment.

This makes it much easier to conduct inspections and declare workers. There is a clear overview for inspectors and a separate database for this kind of registration ("EFA" – Simplified Employment Database). Workers can also be easily unregistered if they do not show up. It is therefore easy to inspect, and there are clear and fast procedures when detecting infringements.

Source: https://ec.europa.eu/social/BlobServlet?docId=21457&langId=en

A further example of an e-initiative to simply compliance, this time regarding micro-entrepreneurial activity, is the entrepreneurial account in Estonia (see Box 18).

▶ Box 18. Simplifying tax compliance: the entrepreneurial account in Estonia

In January 2019, an entrepreneurial account, or business account, was developed in collaboration with an Estonian bank, LHV (LHV Bank, 2020; Veerberk, 2019). While LHV is the bank that offers the service, it is open to other banks as well. The entrepreneurial account is primarily for those providing private person-to-person services (e.g., personal cleaners, gardeners, nannies). When the entrepreneur becomes a business account owner, the bank automatically transfers his/her information to the tax authorities and calculates the amount of tax to be paid. All this is done free of charge.

The income that is transferred to the account automatically deducts the 20% tax rate (or 40% if over €25,000; the maximum amount of income on this account is €40,000). The business account owner can also receive health insurance if the user contributes the minimum amount of social tax. In early 2021, the minimum social tax obligation was €192.72 (ETCB, 2021). In October 2020, over 3,000 entrepreneurial accounts had been created with more than 1 million euros of payments to the accounts (Siiri, 2020).

This e-initiative makes it easy to be tax compliant and thereby also reduces the informal economy. If the business account owner earns above €40,000, they must either register as a sole proprietor (paying social tax and therefore being covered by social protection) or as a business as legal person.

Source: Divald (2021).

To make it easier to comply and incentivize compliance, businesses can be offered help with record keeping. This can include the provision of free record-keeping software to businesses, the provision of fact sheets on record keeping and/or free advice or training such as hotlines or online educational courses.

Alm (2011) finds that uncertainty over tax liabilities reduces both the level of filing as well as the degree of compliance. The clear lesson is that reducing uncertainty on tax liabilities by providing e-services to help businesses to calculate their liabilities reduces non-compliance.

In Finland, for example, two online calculators are available and actively used by workers and employers – the Gross Income Calculator and Tax Percentage Calculator. They encourage taxpayers to learn the process of correct tax calculation and raise their awareness on workers and employers' obligations. The Gross Income Calculator, launched in June 2013, is used in situations where the employer and the employee have agreed on the net amount of wages, but they need an estimate of the correct gross income for the employee to obtain a tax card, and for the employer to prepare their annual payroll report. The Tax Percentage Calculator, launched in December 2002, can be used to estimate whether a person needs a change in the withheld tax percentage rate in case there have been changes in the labour status or circumstances (e.g., if the person is no longer employed or has recently started working).[20] Box 19 provides an example from Italy of the use of online tax calculators.

20 https://ec.europa.eu/social/BlobServlet?docId=20219&langId=en

▶ Box 19. Redditest and Redditometro online tools, Italy

Redditest (Income Test) and Redditometro (Income Meter) are two software tools, aimed at improving tax compliance and tax collection in Italy. Redditest is an online tool for Italian households to work out if they have declared their income correctly, and if they are at risk of inspection from the Italian tax authorities. Redditometro is a risk assessment tool for guiding the inspections of the Agenzia delle Entrate (Italian Revenue Agency) which juxtaposes households' tax returns to predefined consumption groups models, based on data of the actual spending patterns of the Italian households.

1. **Redditest**, launched in 2009, enables taxpayers to self-diagnose whether they are at risk of inspection by the tax authorities. The software, available online and for download on personal computers, enables an anonymous check whether the declared income of a person is consistent with his/her standard of living. Households' standard of living is gauged, based on 80 indicators of hypothetical types of income groups, distributed in 7 categories: homes/real estate; means of transport; insurance and social security contributions; education; sports and recreation; real estate and securities investments; other significant expenses. Based on administrative and statistical data, households are allocated to different standard of living groups, which correspond to the possession of certain assets, the location of their residence, etc. The implicit assumption is that if a household possesses certain luxury items and lives in a certain area, then it needs to have a certain level of income to sustain its standard of living. A large discrepancy between such imputed standard of living and declared income would signal a risk of inspection. It is intended to prompt households to double-check their tax returns, and contact the revenue service to clarify its situation if necessary.
2. After a person enters all the required data, the Redditest produces a green- or a red-light result. A red light indicates an inconsistent standard of living with the stated income/expenses. The user is asked to revise the input data and/or the amount of paid tax to avoid further consequences. If the difference between the declared income and the imputed by Redditest income is over 20%, an inspection by the tax authorities is imminent. To dispel citizens' fears of intrusion on privacy and to prove that Redditest is a pure prevention tool, the Italian Revenue Agency has ensured that the software can be downloaded to a personal computer and data entered offline, which prevents its registration in any way on the web.
3. The **Redditometro**, launched in 2012, is the mirror tool to Redditest used by the Italian tax authorities to assess the risk of tax evasion and to guide their inspection work. It juxtaposes data from households' income declarations, purchases of certain luxury goods, and pre-defined standard of living household groups to assess whether a household is likely to have evaded taxes by declaring a lower income. The household expenditures are controlled through data available in the tax register on purchases of large-scale items and the average expenditure for this type of family unit according to the Italian statistical office (ISTAT). If the identified discrepancy is too high, this triggers a tax inspection. The controlled items of expenditure include houses, cars, entertainment, education, insurance, investments, and major expenses of various kinds such as art, gifts, jewellery and other valuables. The items can be part of the income of both firms and individuals. In 2016, 35,000 control operations have been conducted by executive investigators. The operations were carried out only in the cases where the deviation exceeded 20%.

Sources: https://www.agenziaentrate.gov.it/portale/documents/20143/314941/CS20112012+redditest_Binder1.pdf/3fc7d20c-7f30-b607-85bf-74cd672ac932?version=1.0
https://www.youtube.com/watch?v=G4tpEOHKUjk
https://it.wikipedia.org/wiki/Redditometro
http://www.nytimes.com/2013/01/28/world/europe/italys-new-tool-for-tax-cheats-the-redditometro.html
http://www.bbc.com/news/business-21064030
https://www.panorama.it/italy-todaytop-stories/redditometro-and-redditest-new-weapons-to-fight-tax-evasion-in-italy

In June 2020 in Estonia, the ETCB launched a similar e-service that allows businesses to see their tax behaviour rating online. The legal representative of the company can view their rating based on a traffic-light system. Green represents "everything is okay", yellow indicates "some deficiencies" and red means "serious deficiencies", with guidance provided on how to rectify the rating. Issues are often about incomplete data, but the largest number of cases relate to "envelope wages" (i.e., declared wages of a company which are much lower than the average wages for similar positions). Seeing the company rating in advance allows the company to address the issue before they are approached by the tax authority (ETCB, 2020). As such, this e-measure provides the incentives for companies to address their ratings before they are notified. As audits are expensive and time-consuming processes, it is in the interest of the businesses as well as the government for companies to do so if they are making simple and honest mistakes.

3.3.2. E-initiatives to reward customers for purchasing formally

Besides e-initiatives to encourage businesses and workers to operate in the formal economy and prevent informal work, there are also e-initiatives that encourage purchasers to buy goods and services from the formal economy.

One such e-initiative encourages customers to request receipts so that transactions are recorded. When combined with the use of certified cash registers, this allows a higher proportion of transactions to be recorded and reported. The most popular such e-initiative is the **receipt lottery** that seeks to reduce the informal economy by limiting unreported exchanges through the greater issue of receipts in business-to-consumer transactions. Consumers have an incentive to ask for a receipt because it acts as a free-of-charge ticket to enter lotteries, therefore giving its holder who has requested it a chance to win a lottery prize. As such, in the longer-term, this measure aims to encourage consumers to get in the habit of asking for fiscal receipts. The assumption is that after a time, citizens will develop this habit (e.g., by making asking for receipts socially acceptable and desirable, or by raising awareness about the informal economy) and they will therefore continue to ask for fiscal receipts even if there is no additional monetary incentive. Boxes 20 and 21 report two examples of receipts lotteries in Romania and Slovenia respectively.

▶ Box 20. Receipts lottery, Romania

***Aim*:** to encourage purchasers to ask for receipts so that ("black box") cash registers record all transactions.

***Description*:** In Romania at the beginning of 2015, the National Agency for Fiscal Administration (ANAF) launched a toll-free telephone number where customers can report cases where they have not received a receipt for their purchases. The receipts lottery measure builds on this measure by encouraging consumers to ask for receipts.

Evaluation: A press release by ANAF (September 2015) reveals an increase in declared VAT of 5.85% in the cumulative seven months in 2015 compared with the same period in 2014, prior to the lottery. Moreover, "The consumption of paper rolls for cash registers has increased by 80% since the Receipts Lottery began. So, there are almost two times more receipts being printed" (press release by MasterCard director for Romania, Cosmin Vladimirescu, quoted by Mediafax, October 2015).

Source: https://ec.europa.eu/social/BlobServlet?docId=17873&langId=en

▶ Box 21. Encouraging consumers to check invoices have been declared, Slovenia

Aim: to encourage consumers to check invoices have been declared to the tax authorities.

Description: In Slovenia, a conventional deterrent measure has been designed so that purchasers are incentivized to purchase in the formal economy. In 2018, 54,213 taxpayers were using fiscal cash registers, that issued 1,019,669,639 invoices (2.8 million per day). What is innovative in Slovenia is that the purchasers can electronically check whether the invoice has been verified, using a "Check the invoice" app by scanning the code on the invoice. To incentivize purchasers, those doing so are automatically entered into a receipts lottery with a prize fund which pays up to €25,000.

Evaluation: The outcome is that the number of offences detected have increased from 1,978 in 2016 to 3,135 in 2018, resulting in fines totalling €2.9 million in 2016 and €5.9 million in 2018.

Source: https://ec.europa.eu/social/BlobServlet?docId=18513&langId=en

A further set of demand-side e-initiatives to encourage businesses and workers to operate in the formal economy is reflected in the broader shift towards **incentivising electronic payment systems and deterring cash payments**. Given that informal economy transactions are often, albeit not exclusively, paid in cash, some countries explicitly incentivize the transition to a cashless economy, or disincentivize the use of trackless cash. This is being actively encouraged at present by the large global corporations involved in electronic payment systems. Box 22 summarises the options available to incentivize the use of electronic money via the use of mobile phone apps and credit or debit cards and deter cash payments.

▶ Box 22. Incentivising electronic payment systems and deterring cash payments

Aim: to transfer from cash to electronic payments to prevent informality.

Description: several options exist for countries pursuing this demonetisation approach:

- Introduce a ceiling for cash transactions – nearly all European countries have a ceiling for cash transactions (e.g., €500);
- Make point-of-sale (POS) terminals available across all sectors, such as bars and taxis – this has been widely introduced across all European countries and most sectors to reduce the use of cash;
- For governments to shift more fully towards electronic payments – nearly all government now conduct nearly all their payments electronically;
- Discourage easy access to cash. The presence of no-fee automated teller machines (ATMs) provides uninhibited access to cash and subsequent cash payment at the point-of-sale; and
- Provide incentives for using mobile phone apps and cards at the point-of-sale. Many day-to-day transactions, especially those worth less than €15, remain cash based. Developing incentives for individuals to use mobile phone apps and cards is a way forward.

Evaluations have been conducted in several European countries of the impacts on the informal economy of pursuing this approach. In Greece, the Foundation for Economic & Industrial Research (2015) estimates that the tax revenues increase by 0.24 percentage points for every percentage point growth of the use of payment cards (ILO, 2016).

Some countries have imposed penalties to discourage cash transactions. In Greece, instead of an incentive, taxpayers incur a penalty if they do not make enough electronic payments. As of January 2017, if they do not spend a certain percentage of their annual income through electronic payments, a penalty of 22% is imposed on the missing difference between the

minimum required payment and the actual payment. For a taxable income up to €10,000 at least 10% of their income must be spent via electronic payments. For a taxable income between €10,001 and €30,000, and above €30,000, the minimum percentage increases to 15% and 20% respectively. In addition, tax allowances and tax deductions are available only for electronic payments. On the other hand, the cap for cash transactions fell from €1,500 in 2016 to €500 in 2017. Any purchase of goods or services should be paid electronically now if it accounts for more than €500 (Deloitte, 2016). In Sweden, moreover, cash payments will not be accepted as a means of payment from 2023 and it will become the world's first cashless society (Fourtané, 2020).

A final type of demand-side e-initiative encourages consumers to purchase formal goods and services using "**social label**" e-marketing campaigns that highlight where workers' rights are being respected. This is an increasingly popular initiative being pursued by social partners as well as NGOs. Oxfam has launched the **Supermarkets Scorecard** in the UK to support decent work. This encourages the largest supermarkets to pay attention to their supply chains by raising awareness among consumers about working conditions in their supply chains. The intention is to encourage retailers to map their supply chain and perform a due diligence assessment of their direct suppliers, namely the processing companies.[21] Box 23 highlights a similar social labelling e-initiative in the hotels sector.

▶ **Box 23. The "Just Tourism" social labelling initiative, EFFAT**

Aim: To introduce social labelling of hotels to help tourists select a hotel that respects workers' rights.

Description: EFFAT-IUF have launched the website Just Tourism to help tourists select a hotel that respects workers' rights. This initiative has been introduced in Croatia, Denmark, Ireland, USA/Canada, Norway, Slovenia and Sweden.

Evaluation: No evaluation has yet been conducted. Such an initiative is transferable to many countries.

Source: http://www.justtourism.org/

3.4. Education and awareness raising

There has been recognition that participation in the informal economy is not always a purely rational economic decision. Non-compliance often results from a lack trust in the state and/or a lack of understanding of the benefits of compliance (Williams, 2017) and a lack of horizontal trust in others. Education and awareness raising campaigns can therefore play a key role in facilitating the transition to formality. The intention is to seek voluntary compliance rather than force citizens to comply using threats, harassment and/or incentives (Kirchler, 2007; Torgler, 2007, 2011).

Many e-initiatives are being pursued in the realm of education and awareness raising regarding the benefits of formality and costs of informality to change social norms, beliefs and values regarding what is acceptable and what is not. One example is the increasing adoption of **e-announced advisory inspections**. In Belgium, for example, employers are informed in advance that inspections will take place via online government portals and social media channels. This provides them with an opportunity to put their affairs in order prior to an inspection, and an online checklist is made available to employers regarding what an inspector can investigate[22] and clear online statements of the legislation.[23]

21 https://indepth.oxfam.org.uk/behind-the-price/scorecard/
22 www.siod.belgie.be/fr/checklistscontrole
23 www.siod.belgie.be/fr/directives

Another educational e-initiative to help workers operate in the formal economy is provided by the European Federation of Building and Woodworkers' (EFBWW) trade union (see Box 24).

▶ Box 24. Construction workers wages and rights in Europe App

Aim: To provide information to construction workers on their rights in all EU member states.

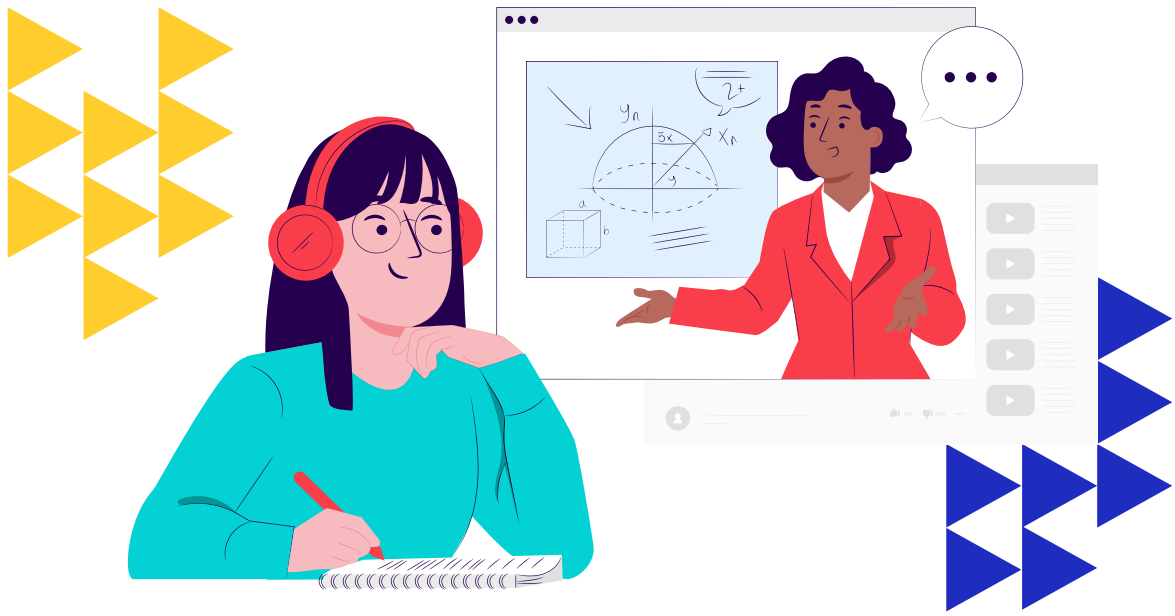
Description: using a free smart card, workers can access a website (https://www.constructionworkers.eu/en/) of the European Federation of Building and Woodworkers' (EFBWW) which provides concise information on wages (e.g., minimum salary by work category), working conditions (e.g., maximum working time), and the rights of construction workers, in all EU member states in all European languages. Construction workers can also find useful links such as contacts for trade union representatives ready to help and support them in case of need both in their country of origin or their host country to get direct support.

Evaluation: This app displays how social partners can initiate, develop and implement information tools to provide advice to workers to prevent informality.

Source: https://www.constructionworkers.eu/en/

A similar e-initiative providing advice and support to temporary agency workers is found in **Belgium**. In 2016, the Belgian trade union confederation (FGTB/ABVV) developed a website to raise agency workers' awareness of their rights.[24] Since October 2016, agency workers in Belgium have had the right to receive a contract before starting work. The contract can be signed on paper or via a computer or smartphone, using an identity card or password. The trade union website explains the legal situation to agency workers, along with advice on how to enforce their rights in practice. It also includes a YouTube tutorial (in French and Dutch) on how to use the online facility.

In Lithuania, meanwhile, the State Labour Inspectorate uses Facebook messenger to provide consultations with employers and workers (see Box 25).



24 https://www.droitsdesinterimaires.be/fr-BE/content/des-le-1er-octobre-le-contrat-d-abord-le-travail-ensuite/29/

▶ Box 25. Using Facebook messenger to provide support and advice, Lithuania

Aim: To make the State Labour Inspectorate for Lithuania (SLI) consultations more available to society, and especially younger audiences, by providing more channels for quicker and effective consultation with the SLI.

Description: Labour lawyers working at the State Labour Inspectorate are assigned a timetable each week so that there are two lawyers on duty every day between 8:00 and 16:00 (one covering the first half of the day, the other covering the second half of the day) to answer questions submitted through Facebook Messenger. Daily, frequently asked questions are usually answered within a couple of hours. Queries tend to concern matters related to the Labour code, interpreting different articles, for example, like wages for additional work, holiday leave etc

Evaluation: In 2017, there were 5,663 consultations via Facebook (which is a 46% increase on 2016), accounting for 4.4% of all consultations.

Source: https://ec.europa.eu/social/BlobServlet?docId=20299&langId=en
https://www.facebook.com/Valstybin%C4%97-darbo-inspekcija-prie-Socialin%C4%97s-apsaugos-ir-darbo-ministerijos-185017294961513/

In Belgium, a robot has been placed at the reception of Belgium's National Office for Social Security which has a "chat box" powered by artificial intelligence and answers initial questions of customers. In addition, a wide range of online content has been provided, especially to reach younger people, including a "Students at Work" app (informing on how many hours students can work legally), Facebook and YouTube clips, humorous sketches (played by actors), instructional videos, and vlogging (video blogging) about fraud by influential people.

Indeed, across European countries, a multitude of videos have been published by both enforcement authorities and social partners, largely targeting employers and workers who engage in informal work (rather than purchasers of goods and services produced in the informal economy) and focusing upon the benefits of operating in the formal economy rather than the costs of operating in the informal economy. In 2020, the European Commission's European Platform tackling undeclared work organised an educational and awareness raising campaign about the benefits of undeclared work using the hashtag #EU4FairWork and with two main messages "Earn, Declare, Benefit" and "Fair Work, Fair Play". Good practice examples from this campaign showing how social media can be used to raise awareness about the informal economy include the following European Commission #EU4FairWork products:

- Campaign videos:
  - Declared work means peace on mind[25]
  - Working declared provides security in uncertain time[26]
  - Declared work protects your business and your workers in uncertain times[27]
- Interactive game: Out of the shadows: find your way to fair work[28]
- Campaign quiz: "How well do you know undeclared work"[29]
- Social media competition for workers[30] and competition for employers [31]

25 https://audiovisual.ec.europa.eu/en/video/I-187194?lg=OR
26 https://ec.europa.eu/social/main.jsp?catId=1496&langId=en&videosId=3107&furtherVideos=yes
27 https://audiovisual.ec.europa.eu/en/video/I-194498
28 https://ec.europa.eu/social/main.jsp?catId=1299&intPageId=5397&langId=en
29 https://app.involve.me/eu4fairwork/quiz
30 http://wshe.es/8G6d6CUr
31 https://dff46c7e.wishpondpages.com/eu4fairwork/

In addition, good practice examples of social media videos and other multimedia products produced by national enforcement authorities and social partners include:

- a 90-second youtube video produced by the Hellenic Labour Inspectorate in Greece in collaboration with social partners on the benefits of formality, which has had 784,000 views: https://www.youtube.com/watch?v=9mQ5BeVqU6c
- virtual reality films on the benefits of formality produced by the Swedish Work Environment Authority.[32]
- a multimedia truck visiting schools to promote the benefits of formality through augmented reality games, presentations, and a quiz. See video reportage.[33]
- Employers, trade unions and public authorities collaborated in a Norwegian project to reach drivers "on the road", and inform them about rights, entitlements and duties with the help of a truck driver's mother.[34] Translated into 14 languages, this video received 7 million views: https://www.youtube.com/watch?v=0_I-UwlMkR8
- a Belgian campaign targeting students who work[35] on the benefits of formal work,[36] including a mobile app[37] and a YouTube video.[38]
- An Estonian Tax and Customs Board website campaign "Thank you for paying taxes"[39] targeted primarily at employees, thanking them for paying their taxes and underlining that those funds are the reason that hospitals, schools, roads and pensions exist. It also shows that personal benefits from paying taxes (e.g., a mother's pension or son's school allowance) could be lost if there were no taxpayers. The campaign includes a video.

There are also numerous apps produced allowing citizens to evaluate the impact of their participation in the informal economy. Good practice examples include:

- In 2011, the Latvian Employers' Confederation (*Latvijas Darba Devēju konfederācija, LDDK*) launched a national campaign "Against the shadow economy – for fair competition",[40] one component of which was an online tool – a test for measuring an individual's "shadow" on www.manaena.lv. Answering 11 questions in the test, individuals could discover the extent of their "shadow" behaviour in shops, markets and communication with service providers (taking or leaving receipts on purchases), in hospitals (extra payments to doctors), transport (extra payments to police officers), employment (working with or without an employment contract, undeclared income from work – "envelope wages") and their total impact on the amount of the shadow economy in Latvia. Participants were then advised how to reduce their own "shadow", namely to pay the official price for service, to require receipt in shops and other shopping places, to ensure that taxi-meters were working, to use only certified fuel in cars. Among these measures there was advice to ensure that employment contracts met the requirements of the labour law, for instance, and that the contract agrees the full salary, not only part of it. From its opening on 10 October 2011 until 7 November 2011, 12,657 individuals completed the test at www.manaena.lv
- In Bulgaria, an "envelope wages" awareness raising campaign (http://www.zaplatavplik.bg/) uses an online app tool for employees to calculate the negative costs of accepting envelope wage payments. Employees input their envelope wage and see how much they are losing in maternity pay, sick pay, unemployment pay and pension contributions. It also shows how much they will lose in total over the next thirty years.

32 https://ec.europa.eu/social/BlobServlet?docId=20470&langId=en
33 https://youtu.be/5sdWoAIZSGs
34 http://www.motherpresents.org/en/
35 http://www.mysocialsecurity.be/student/en
36 https://ec.europa.eu/social/BlobServlet?docId=20298&langId=en
37 https://play.google.com/store/apps/details?id=be.fgov.onssrszlss.studentatwork
38 https://www.youtube.com/user/rszonsslss
39 https://palk.emta.ee/ru
40 https://www.eurofound.europa.eu/data/tackling-undeclared-work-in-europe/database/employers%2592-campaign-against-the-shadow-economy-latvia

- In Estonia, a tax calculator has been created called "Where does my money go?",[41] so people can see the societal benefits of paying taxes. The calculator is hosted on the website of the campaign against envelope wages, run by the Estonian Tax and Customs Board.[42]

3.5. Modernizing formal institutions

It is likely that education and awareness raising campaigns, which seek to change attitudes towards informal work, will only be successful if there is a change in formal institutions. Where there is a lack of trust in government or a lack of belief by citizens, workers and businesses in the formal institutions, it is arguable that attitudes will not change. Therefore, to better align civic morality (about the acceptability of informal work) with the laws and regulations, it is not just attitudes of citizens, workers and employers that need to change. The formal institutions themselves also need to change so that there is greater trust in them.

Firstly, this requires government to change the structural conditions that are associated with higher levels of informality. The key structural condition that this report has addressed is the provision of e-services by government which section 3 revealed is associated with a higher prevalence of informality. Technology has a key role to play in facilitating the transparency and accountability of public institutions.

If such e-services are provided by government, then this modernization of enforcement authorities will improve trust in government and prevent participation in the informal economy by making them more customer-friendly and easily approachable. Citizens often do not adhere to the formal rules, and there is thus a breakdown in the social contract between government and its citizens, due to a low level of trust in government. A modernization of governance is thus one way forward. The outcome will be improvements in:

- **Procedural justice**, which here refers to the authorities treating citizens in a respectful, impartial and responsible manner and thus shifting away from a "cops and robbers" approach and towards a service-oriented approach;
- **Procedural fairness**, which refers to citizens believing that they pay their fair share compared with others; and
- **Redistributive justice**, which relates to whether citizens believe that they receive the goods and services they deserve given the taxes they pay.

The net outcome will be a transition to formality due to such user-friendly services creating trust in government.

3.6. E-initiative responses to the new types of non-compliance and informality from the COVID-19 pandemic

With the reduction in onsite workplace inspections following the COVID-19 pandemic, enforcement authorities in Europe, like elsewhere, have been turning more to e-initiatives to facilitate the transition to formality and tackle non-compliance. In this section, the key issue addressed is how enforcement authorities have been responding to the new types of informality and non-compliance involving the "bogus declaration of the suspension of work" that are arising from abuse of the employment retention schemes and short-term financial support schemes supporting business more generally.

Many of the e-initiatives identified above have been used. Firstly, **data mining and matching** has been heavily used. The type of data mining and matching used has depended on the type of non-compliance being investigated. Where the intention has been to identify whether employees are claiming for two types of support when they are entitled to only one, then data matching has examined if a citizen is matched across databases for different types of support (e.g., wage compensation under an employment retention scheme and unemployment benefit). In Spain, in contrast, data matching has been used to identify whether employers claiming support for temporary suspension of employment contracts are at the same time employing new workers. Indeed, resulting from such data matching by the Anti-Fraud Unit of the Spanish labour inspectorate along with complaints

41 http://kalkulaator.meieraha.ee/en/
42 http://palk.emta.ee/

received in the inspectorate's **online complaint reporting tool**, the Spanish labour inspectorate (ITSS) has sent out 75,000 **e-notification letters** targeting companies who had received support for the temporary suspension of employment contracts (ERTE) informing them about their obligations regarding the temporary suspension of employment contracts and the consequences of any infringement of the regulations. So far, €9 million of violations have been detected and claimed, of which almost €3 million detected and claimed for social security violations.

In Norway, to identify whether there are fraudulent claims for "ghost" businesses as well as "ghost" ("fictitious") employees (e.g., non-existent employees) from the wage compensation scheme, data from the employment register, public company information, bank statements and the Norwegian tax administration is analysed. The finding is systematic fraud involving companies which were newly registered after lockdown commenced that were not VAT registered and had no revenue, but submitted fictitious employment and income, often registered on the same day as the application for wage compensation was submitted (and deleted shortly afterwards). This fraud has been estimated to total NOK 28 million (circa €2.8 million), which is 0.35% of the total wage compensation income paid.

Other types of **data mining** that have occurred to identify these bogus declarations of the suspension of employment contracts and other new forms of informality resulting from abuse of these employment retention and other schemes include:

- Comparing turnover reported from fiscal cash register records with claimed reduction in turnover when short-term financial support is based on specific levels of reduced turnover;
- Using "third party" data from telecommunications providers to examine the phone records of employers to determine whether they have been making phone calls to an employee whilst suspended or if employees are engaged in work-related activity (i.e., requesting data held by telecoms operators including the time, duration and location of a phone call as well as the number dialled), and
- Using "third party" data from internet service providers (ISPs) to analyse websites visited by an individual to assess whether they are engaged in work-related activity. For example, in Spain, and related to teleworking, the labour inspectorate (ITSS) has been checking the email flow (not content) and whether there is teleconferencing taking place.

Besides data mining and matching, other tools used to tackle new types of non-compliance and informal work resulting from abuse of these schemes include:

- Establishing a **web-based complaint reporting tool** to receive information on abuses of the short-term financial support schemes – for example, this has been used, as described above, by ITSS in Spain.
- Publishing an **e-register of businesses claiming short-term financial support and proportion of staff temporarily suspended** – Norway, for example, has published an open e-register on businesses receiving wage compensation support and anybody can see the companies receiving help and for how many workers.
- **Data-driven "nudge" letters** to stimulate voluntary disclosure by businesses of fraud and error – exemplified above in Spain as a follow-up to data mining.

4 Conclusions

The aim of this report has been to build upon the seminal publication that introduced the concept of "e-formality" and how new technologies applied in public initiatives, programmes, and policies can potentially make the transition to formalization easier (Chacaltana et al., 2018). The present report has extended this by examining "e-formalization" in European countries.

This is a timely issue because the lockdown and physical distancing measures resulting from the COVID-19 pandemic has made e-formalization more relevant and pertinent, not least due to the reduction in onsite workplace inspections and adoption of e-initiatives as a complement to traditional workplace inspections. Therefore, the pandemic has perhaps accelerated the trend towards the use of innovative, information-intensive and connectivity-based tools or approaches.

In this report, firstly, the impact of the COVID-19 pandemic on informality in Europe has been examined. This has revealed that new forms of informality and non-compliance have arisen resulting from the abuse of the short-term financial support schemes that largely involve the bogus declaration of the suspension of employment contracts. It has also revealed the relationship between digital transformation and informality in the European context, displaying that there is a strong association between the cross-country variations in the adoption of digital technologies and the prevalence of the informal economy. Countries with a low level of adoption of digital technologies, measured by the DESI, have significantly larger informal economies. Nevertheless, some caution is urged since this bivariate correlation does not imply causation.

The main bulk of the report has then mapped out the wealth of e-formalization policy initiatives being pursued in Europe across the full range of policy tools available, along with good practice examples from an array of European countries. On the one hand, this has revealed that in Europe, e-initiatives have been used to improve coordination across government and pursue a cross-government integrated approach,

as recommended in R204, and this is especially the case regarding data collection, sharing and analysis. On the other hand, and in terms of policy tools for the transition to formality, although the emphasis in Europe is perhaps on using digital technologies to increase the probability of detection, there are many examples of e-initiatives being directly used to tackle informality across the full range of policy measures available, namely: (i) improving the risks of detection; (ii) sanctions; (iii) improving the ease and benefits of operating formally; (iv) education and awareness raising and (v) modernizing formal institutions.

Having collated these e-formalization policy initiatives being used in Europe, and recognizing that similar exercises have been undertaken in the Asia-Pacific regions (Bhattaria, 2018) and Estonia (Divald, 2021), the following key recommendations are made to facilitate further progress on the development of "e-formalization":

- "E-formality" is an emergent concept which remains unfamiliar to most enforcement authorities. They do not explicitly conceptualize the multitude of e-initiatives they are pursuing as "e-formalization". As a result, mutual learning events need to be organized for enforcement authorities to understand the concept of "e-formalization".
- Mutual learning events also need to be organized so that those involved in tackling the informal economy across the world can learn from each other and build their capacities to pursue e-formality. In other words, there is no need for each country to "reinvent the wheel".
- This mutual learning needs not only to exchange knowledge, skills, resources and technical know-how on e-formality initiatives, but also facilitate learning of participants with each other about the challenges involved in making progress on e-formalization and how these can be overcome, so as to enable faster progress on e-formality than would otherwise be the case.
- The role of ILO and its experts can facilitate these discussions by identifying and disseminating good practices.
- To ensure countries work as equal partners, and ensure equality and horizontality, the lesson from this study is that different countries are at different stages on each type of e-initiative. This is the case on a North-North basis and is doubtless also the case on a North-South and South-South and Triangular Cooperation basis. It is therefore essential that this is recognized in mutual learning events.

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Annexes

▶ **Table A1. Overall Digital Economy and Society index**

Country	2015	2016	2017	2018	2019	2020
European Union	**38.9**	**41.3**	**43.9**	**46.6**	**49.5**	**52.6**
Austria	40.5	43.2	45.6	48.5	51.1	54.3
Belgium	42.9	46.4	49.0	50.2	53.0	58.8
Bulgaria	26.8	28.6	29.9	33.5	33.8	36.5
Cyprus	30.7	34.4	36.8	39.3	41.5	44.0
Croatia	33.2	36.4	38.9	40.9	44.3	47.6
Czech Republic	38.1	39.3	42.0	44.7	47.3	50.8
Denmark	57.1	58.3	61.6	62.4	66.0	69.2
Estonia	48.7	51.4	53.2	55.7	58.3	61.1
Finland	56.7	58.3	60.5	62.8	68.1	72.3
France	37.6	40.3	43.1	45.8	49.9	52.3
Germany	41.0	44.0	45.5	47.9	51.1	56.0
Greece	26.2	27.5	30.4	32.3	35.2	37.2
Hungary	31.7	33.8	36.8	39.9	42.3	47.6
Ireland	43.2	46.7	48.9	53.2	57.9	61.8
Italy	29.7	32.2	34.2	36.2	41.6	43.7
Latvia	38.7	42.0	44.1	46.9	49.8	50.8
Lithuania	40.3	42.5	45.0	49.4	51.7	53.9
Luxembourg	44.7	46.8	49.3	52.5	54.5	57.9
Malta	46.5	49.2	52.0	53.2	55.4	62.7
Netherlands	51.2	54.7	57.6	60.8	63.5	67.7
Poland	31.4	32.6	35.4	37.7	40.7	44.9
Portugal	37.0	40.8	42.2	44.9	47.0	49.6
Romania	27.0	29.8	31.7	35.2	36.5	40.0
Slovakia	33.0	34.9	38.6	41.9	42.8	45.2
Slovenia	38.2	41.1	43.3	46.0	48.7	51.3
Spain	41.4	44.0	46.1	50.2	53.6	57.5
Sweden	55.1	57.3	60.0	64.0	67.5	69.7
United Kingdom	45.7	48.7	51.2	53.7	56.5	60.4

Source: https://digital-agenda-data.eu/datasets/desi/indicators

▶ Table A2. e-Government - DESI e-Government sub-dimension

Country	2015	2016	2017	2018	2019	2020
European Union	**50.2**	**54.2**	**57.9**	**61.8**	**67.0**	**72.0**
Austria	59.9	66.4	69.8	72.3	76.3	80.8
Belgium	51.5	57.3	57.4	62.4	65.8	71.7
Bulgaria	36.7	41.4	44.9	52.5	56.5	61.8
Cyprus	48.5	54.8	57.3	62.1	65.7	69.0
Croatia	27.1	38.2	41.6	43.7	50.8	55.8
Czech Republic	33.0	37.5	47.9	54.1	59.9	62.4
Denmark	74.4	77.0	78.7	80.0	82.7	87.1
Estonia	77.3	80.5	80.7	83.0	85.0	89.3
Finland	72.1	74.2	75.4	78.3	82.0	87.0
France	45.8	53.2	58.8	63.8	69.3	76.7
Germany	42.3	49.3	53.0	56.4	58.8	66.4
Greece	20.6	27.0	33.7	41.2	46.4	51.5
Hungary	28.2	28.9	35.2	43.6	50.7	57.8
Ireland	61.0	63.1	66.7	71.2	78.1	80.6
Italy	46.0	49.1	50.5	54.1	61.9	67.5
Latvia	54.6	61.6	68.6	74.5	80.2	85.1
Lithuania	60.6	67.5	70.0	76.6	79.4	81.4
Luxembourg	41.6	44.9	49.2	57.2	64.9	73.7
Malta	71.2	71.4	74.5	73.5	75.2	78.1
Netherlands	66.3	69.9	70.8	74.7	79.6	81.0
Poland	53.1	53.3	54.2	54.9	61.5	67.4
Portugal	67.6	68.1	66.5	67.4	73.4	75.1
Romania	31.1	34.2	37.1	41.1	45.0	48.4
Slovakia	30.6	31.1	40.5	48.0	50.7	55.6
Slovenia	46.0	52.3	52.9	58.7	64.5	70.8
Spain	64.1	66.6	69.7	76.6	80.9	87.3
Sweden	65.6	71.6	73.1	74.8	77.9	79.3
United Kingdom	48.8	53.3	54.9	59.0	64.8	70.8

Source: https://digital-agenda-data.eu/datasets/desi/indicators

▶ Table A3. e-Government Users

Country	2015	2016	2017	2018	2019	2020
European Union	**56.9**	**57.1**	**59.7**	**58.5**	**64.3**	**67.3**
Austria	58.4	60.6	59.1	64.1	67.5	70.0
Belgium	50.5	47.8	47.8	50.0	50.9	52.9
Bulgaria	54.0	64.2	56.9	58.1	60.8	60.9
Cyprus	38.1	45.6	48.0	48.9	53.0	50.9
Croatia	49.3	58.0	66.4	66.1	75.4	65.3
Czech Republic	27.7	24.0	34.9	33.5	51.5	50.8
Denmark	85.4	87.7	89.1	85.9	89.9	91.2
Estonia	93.5	94.7	93.2	96.1	92.3	93.1
Finland	90.7	89.9	91.0	91.4	91.7	94.4
France		54.6	62.5	67.0	71.4	76.2
Germany	33.1	36.2	38.0	38.9	42.6	49.3
Greece	44.2	46.1	41.7	37.9	36.2	39.1
Hungary	53.3	41.0	37.8	44.6	53.2	55.2
Ireland	71.7	71.6	71.2	77.3	71.6	76.4
Italy				29.9	37.2	32.3
Latvia	66.5	76.5	69.0	76.6	81.1	83.1
Lithuania	82.0	78.4	77.8	80.6	80.6	80.9
Luxembourg	51.0	49.5	45.3	49.1	54.7	57.8
Malta	63.6	56.1	60.3	48.2	50.3	56.8
Netherlands	83.0	84.3	83.2	84.1	86.2	85.9
Poland	41.3	43.0	45.3	45.2	48.9	54.2
Portugal	64.2	62.3	58.4	55.6	70.2	69.8
Romania	90.3	94.0	84.4	80.4	82.1	82.2
Slovakia	60.0	53.1	65.1	55.5	54.0	52.2
Slovenia	44.4	55.0	50.4	53.6	56.2	58.6
Spain	66.2	66.8	66.4	67.2	75.7	81.9
Sweden	80.0	81.3	83.2	90.3	93.1	89.3
United Kingdom	68.9	74.2	75.2	79.7	84.0	88.5

Source: https://digital-agenda-data.eu/datasets/desi/indicators

▶ Table A4. Pre-filled Forms

Country	2015	2016	2017	2018	2019	2020
European Union	**45.5**	**48.7**	**48.8**	**53.3**	**57.9**	**59.4**
Austria	52.1	61.9	72.3	79.4	81.4	81.4
Belgium	62.0	65.3	58.5	68.1	72.5	70.1
Bulgaria	19.3	22.7	19.4	24.9	26.4	34.1
Cyprus	70.0	59.6	52.1	58.4	58.4	60.0
Croatia	2.0	20.6	19.6	20.3	30.1	33.1
Czech Republic	27.6	29.1	43.1	49.4	51.0	52.5
Denmark	76.6	76.7	71.4	71.4	68.9	68.9
Estonia	92.7	95.1	88.8	88.4	89.3	89.6
Finland	81.0	87.0	82.4	85.5	81.9	81.9
France	27.0	27.0	26.9	31.8	35.8	39.8
Germany	33.7	34.1	37.8	38.0	41.1	41.1
Greece	7.3	8.1	4.6	14.0	23.0	24.5
Hungary	19.4	19.0	23.0	27.7	31.0	41.8
Ireland	32.2	35.0	35.3	39.2	66.7	57.1
Italy	41.4	37.3	32.5	32.5	48.3	48.3
Latvia	38.3	50.9	58.1	71.1	82.5	85.6
Lithuania	66.9	74.0	69.1	84.8	88.1	88.3
Luxembourg	12.3	20.4	30.3	49.9	55.4	66.5
Malta	87.4	92.4	98.3	100.0	100.0	100.0
Netherlands	69.0	76.0	73.5	77.3	81.1	77.5
Poland	67.9	63.0	58.1	48.1	53.9	58.0
Portugal	76.3	81.0	74.0	74.0	81.3	81.9
Romania	6.6	5.5	11.9	11.9	10.4	10.4
Slovakia	22.2	19.1	27.9	33.5	35.1	37.6
Slovenia	42.9	43.3	42.8	51.1	60.9	64.0
Spain	56.2	67.8	67.0	71.7	73.6	80.3
Sweden	75.0	74.7	71.0	73.9	75.6	75.6
United Kingdom	8.6	16.7	16.4	17.0	18.0	20.9

Source: https://digital-agenda-data.eu/datasets/desi/indicators

▶ Table A5. Online Service Completion

Country	2015	2016	2017	2018	2019	2020
European Union	**75.2**	**80.7**	**82.1**	**85.5**	**87.4**	**89.8**
Austria	90.4	98.1	96.6	96.6	97.4	97.4
Belgium	81.3	84.9	83.9	85.3	86.4	87.8
Bulgaria	60.7	64.4	70.5	73.4	74.8	79.4
Cyprus	60.7	73.4	72.6	76.9	78.1	78.9
Croatia	54.1	60.6	60.5	61.6	63.8	72.9
Czech Republic	57.9	70.3	76.8	81.8	82.4	82.1
Denmark	87.3	93.9	95.0	94.9	95.1	98.6
Estonia	93.9	96.4	96.6	96.9	97.9	97.9
Finland	89.7	92.9	92.9	93.8	95.6	95.8
France	80.0	86.0	86.1	88.5	90.4	92.6
Germany	74.9	82.7	83.4	87.9	88.4	89.8
Greece	48.1	53.9	63.1	76.1	81.6	84.3
Hungary	44.6	54.7	63.1	75.3	81.6	86.8
Ireland	90.5	90.3	89.3	88.7	88.0	88.0
Italy	78.0	85.0	83.8	89.0	90.8	92.3
Latvia	81.6	85.4	90.8	90.5	93.5	96.4
Lithuania	75.9	87.9	91.6	95.3	96.4	96.1
Luxembourg	72.0	77.9	76.9	81.1	86.6	89.6
Malta	99.0	99.9	99.9	99.9	100.0	100.0
Netherlands	85.1	91.1	89.1	90.8	92.3	89.6
Poland	77.6	80.0	79.3	81.0	83.6	86.8
Portugal	97.7	97.7	96.1	97.5	98.5	98.6
Romania	51.3	53.6	54.5	62.4	66.6	70.3
Slovakia	45.6	58.9	67.1	77.6	79.4	85.0
Slovenia	72.4	84.0	83.9	84.1	86.1	91.3
Spain	91.3	91.4	89.1	95.1	94.6	95.8
Sweden	86.9	88.9	90.3	90.0	91.6	91.8
United Kingdom	77.0	76.9	76.3	81.1	86.1	92.6

Source: https://digital-agenda-data.eu/datasets/desi/indicators

▶ Table A6. Digital public services for businesses

Country	2015	2016	2017	2018	2019	2020
European Union	**71.0**	**76.8**	**80.7**	**82.7**	**84.3**	**87.6**
Austria	83.0	89.2	90.5	84.2	86.8	93.1
Belgium	60.1	78.2	78.6	80.6	80.5	93.0
Bulgaria	62.3	65.0	73.6	88.8	92.6	92.6
Cyprus	74.3	84.7	91.5	91.5	90.8	91.1
Croatia	46.6	60.5	60.8	60.8	62.5	65.3
Czech Republic	63.8	66.9	73.3	81.1	79.8	79.8
Denmark	100.0	100.0	100.0	100.0	100.0	100.0
Estonia	86.8	93.1	93.1	93.1	93.8	100.0
Finland	80.6	80.6	80.4	80.4	85.8	92.1
France	59.4	77.7	84.4	84.9	86.3	92.6
Germany	67.4	82.1	84.3	84.3	79.6	92.1
Greece	29.2	44.8	58.8	60.4	60.0	63.1
Hungary	58.3	57.6	67.7	72.5	79.1	85.3
Ireland	84.5	90.8	97.2	99.0	99.0	99.0
Italy	72.6	78.9	80.8	80.8	82.0	94.5
Latvia	75.3	80.0	93.1	93.1	90.2	90.2
Lithuania	78.7	87.3	91.0	92.6	93.2	93.2
Luxembourg	72.9	72.9	80.3	81.6	88.5	99.0
Malta	92.0	93.8	93.8	93.8	93.8	93.8
Netherlands	78.5	78.3	79.4	80.9	84.5	84.5
Poland	70.0	70.0	68.8	69.6	75.4	75.4
Portugal	87.5	87.5	87.5	87.5	87.5	87.5
Romania	33.5	40.6	47.8	50.6	53.3	53.3
Slovakia	58.6	50.8	57.5	73.1	77.7	84.1
Slovenia	67.1	67.9	66.5	72.8	74.3	76.7
Spain	81.3	81.3	88.4	94.6	93.2	93.2
Sweden	78.5	98.6	98.6	92.2	92.2	92.4
United Kingdom	84.6	92.2	92.2	92.2	97.2	97.2

Source: https://digital-agenda-data.eu/datasets/desi/indicators

▶ Table A7. Open Data (data only for 2020)

Country	2020
European Union	**0.659**
Austria	0.659
Belgium	0.647
Bulgaria	0.574
Cyprus	0.802
Croatia	0.690
Czech Republic	0.636
Denmark	0.778
Estonia	0.674
Finland	0.757
France	0.892
Germany	0.684
Greece	0.663
Hungary	0.324
Ireland	0.909
Italy	0.767
Latvia	0.750
Lithuania	0.530
Luxembourg	0.630
Malta	0.416
Netherlands	0.780
Poland	0.777
Portugal	0.418
Romania	0.574
Slovakia	0.331
Slovenia	0.750
Spain	0.898
Sweden	0.551
United Kingdom	0.603

Source: https://digital-agenda-data.eu/datasets/desi/indicators

▶ Table A8. Estimates of the size of undeclared work and the shadow economy in European Union

Country	Undeclared work (% of labour input), 2013 [1]	Shadow economy (% of GDP), 2017 [2]
Austria	8.7	7.1
Belgium	11.9	16.5
Bulgaria	17.8	22.9
Cyprus	13.8	25.2
Croatia	14.2	22.7
Czech Republic	7.7	11.7
Denmark	9.6	11.7
Estonia	14.8	20.1
Finland	9.3	10.8
France	8.8	11.7
Germany	4.4	10.4
Greece	12.4	24.8
Hungary	17.3	19.8
Ireland	8.6	9.6
Italy	12.9	19.8
Latvia	18.3	18.0
Lithuania	19.8	19.7
Luxembourg	5.4	8.8
Malta	No data	18.6
Netherlands	5.2	8.8
Poland	20.8	19.9
Portugal	6.6	16.1
Romania	18.9	23.0
Slovakia	13.4	13.1
Slovenia	13.2	19.0
Spain	8.8	20.3
Sweden	7.7	10.7
United Kingdom	2.7	9.4

Sources: [1] Williams et al. (2017); [2] Medina and Schneider (2019).

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