

THE USE OF CASH IN THE FINNISH GREY ECONOMY¹

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Abstract: This study aims at assessing the size of Finland's grey economy and use of cash in the grey and criminal economy. International studies on Finland and other Nordic countries using the MIMIC multivariate method have suggested rather high GDP shares of the grey economy (14–17%). To clarify this picture, we rely on 28,682 official Finnish tax audits performed during 2003–2009. While the tax audits, which are organized by sector, provide the most reliable available measure of tax evasion, the shares are biased upwards as tax audits tend to focus on companies subject to denunciation or other financial red flags rather than a random sampling. As the magnitude of the selection bias can only be estimated by investigating all firms, this study is limited to estimating the maximum size of Finland's grey economy.

We examine the grey economy's extent by each sector independently, using both corporate accounts (production) and household consumption (demand) statistics. In this way, we verify our estimate of the size of the grey economy from two perspectives. The study also attempts to measure the use of cash in Finland's grey economy. Although the results on the size of the grey economy should only be considered as indicative, the maximum size of the concealed grey and illegal economy appears to be only in the range of 1–2 % of GDP. Based on these estimates, the use of cash in the grey economy would be well below €1.5 billion. Compared to estimated overall cash use in Finland, this translates to 10 % of total cash spending at most.

Keywords: grey economy size, tax evasion, tax inspections, cash usage

Introduction

The term *grey economy* refers to economic activity that circumvents the tax consequences of the activity (taxes and various statutory charges). Examples of this species of tax evasion include *undeclared work* at a construction site for which the worker does not file a proper tax return, pay taxes or make social security contributions, or *by-sales*, commercial transactions that are not recorded as sales in order to avoid VAT. In the EU, some *criminal activities*, i.e. activities prohibited by law, are often included as part of the grey economy.

In this study, we are specifically interested in the fiscal grey economy, the realm of tax evasion. We seek to investigate the grey and illegal economy insofar as it relates to tax

evasion and the use of cash in tax evasion. The role of cash in the grey economy is particularly interesting as estimates and arguments are quite diverse. Moreover, cash arguably offers a greater range of possibilities for tax evasion than electronic payment methods. This view is bolstered by the anonymity of the use of cash and opportunities to use cash outside electronic payment systems, sometimes in ways that are impossible to monitor.

In Finland's highly managed society, the possibilities for grey economic activity have been limited by various means, including the practice of paying wages via bank accounts, the automation of taxation and withholding, the introduction of household deductions and a variety of reporting obligations.

International estimates put the size of grey economies in the Nordic countries, including Finland, at around 14–17% of GDP.² This figure may seem high in light of Finland's efficient public administration and the comprehensive application of electronic monitoring and control systems developed over decades. Even so, these high-end estimates of the grey economy were fundamental to the argument of Finnish lawmakers in justifying strong policies to curtail grey economic activity. For example, report on the grey economy submitted to the Finnish parliament in 2010 became the basis for creation of a special unit within the Finnish Tax Administration to combat grey economic activity. Targeted means such as the introduction at construction sites of identity cards that included tax data, a reverse VAT charge mechanism for main contractors in construction, electronic site-specific personal registers and cards and contract tax return procedures reduced opportunities for businesses to engage in tax evasion. Since its establishment in 2011, the Grey Economy Information Unit of the Finnish Tax Administration has conducted a number of studies on the effects of these targeted measures.

The operation of the grey economy is diverse. Opportunities to engage in grey economic activity vary across industries. Such variation has also been identified in international research. In the construction industry, for example, the grey economy is often associated with undeclared wages or the evasion of income taxes and underpayment. In the restaurant branch, financial deception may be realized through failure to declare cash income or VAT evasion. This study uses tax inspection data as a principal source of information. As the data are classified by industry, it is also possible to estimate the size of the grey economy from the production side of these industries. On the demand side, it is possible to use VAT reporting for consumption groups as they are categorized by commodity category. The role of the grey economy in retail trade varies according to consumption group as does also the use of cash.

Finland has taken a variety of measures to combat private consumption in the grey economy. A requirement that sellers offer a receipt has applied to every payment transaction since 2013. In addition, the use of cash as a method of payment has fallen by half over the past 15 years, further reducing opportunities for tax evasion. In order to use cash in the grey economy to pay undeclared wages, it must first be received from customers as sales revenue.

As our focus is on the economic effects of the grey economy – their fiscal significance due to tax evasion – rather than the social consequences of activities such as drug trafficking. We also do not undertake to measure the grey economy as there is no universally accepted definition of the grey economy, a sphere of economic activities that involves concealing, disguising or otherwise assuring transactions remain outside official surveillance.

The role of cash and its usage in the grey economy deserves particular attention as restrictions on the use of cash are often accompanied by hopes for an effective reduction in the grey economy. Some countries in southern Europe, where there is heavier reliance on cash payment, have sought to restrict cash in the euro era. Denmark is the only country in Central Europe and the Nordic countries that has introduced cash payment restrictions.

While the effects of cash payment restrictions have not been widely researched, it is obvious that grey economic activity cannot be completely or even effectively prevented solely by restricting the use of cash. Businesses frequently come up with new ways to reducing their tax burden, both legally and illegally, e.g. through shell companies or swapping receipts. Cash predominates in illicit activities such as drug trafficking and prostitution.

A sector-by-sector survey for Finland shows that the vast majority of cash use is legal. Cash savings and the share of cash used in the grey economy is small. Finland's heavily concentrated retail trade has also structurally reduced the size of the grey economy.

Initially, Section 2 reviews observations on Finland's use of cash in the euro era. Section 3 examines approaches to measuring the grey economy, arguments presented about its possible size and the role of cash in the grey economy.

Section 4 describes the role of cash in the operation of the grey economy and tax evasion. Section 5 presents calculations of the estimation of the maximum size of the grey economy in Finland using 2017 statistical data. Section 6 summarizes the results and discusses the challenges of capturing the many aspect of grey economic activities and tax evasion, even for a single country and legislative context. Section 7 provides a brief summary of the findings.

2. Acquisition and Possession of cash and use in the Grey Economy

Economic theory identifies two distinct uses for cash: payment and saving. People typically carry around a small amount of cash around in their wallets for payment purposes. In the years before the Covid-19 pandemic, the Bank of Finland's (BoF) consumer surveys found respondents carried an average of €50 in cash on their person. During the pandemic, that average rose to €80. The ECB's SPACE consumer survey from July 2020 found that Finnish respondents kept average of €534 of cash on hand, and that 72 % of respondents kept no separate cash savings in reserve.

The use of physical cash as payment also requires acquiring the cash before it can be used for payment. This involves such actions as withdrawing cash from the bank's current account through an ATM, a bank branch, a shop cash register, or alternatively obtaining

cash through an interpersonal transaction or money transfer. Although Finnish law banned cash payment of wages in 2013, 5 % of Finnish respondents still reported receiving at least a quarter of their regular income in cash in the ECB's SPACE consumer questionnaires in July 2020.³

In electronic payments, the purchasing power in the bank's current account can be used directly once the payer and the bank account connected to it have been identified via a payment card, network connection, or mobile application. The main distribution channels for cash to the public are ATMs and cash withdrawals from bank branches, of which ATMs are by far the most common. Larger cash items and larger banknote types must be obtained from bank branches. The third distribution channel – cash withdrawals at store cash registers – has been growing, but so far remains less significant (Figure 1).

Cash also circulates through interpersonal exchanges and money transfers, and thereby evades electronic registration. Most cash usage involves payment, but the cash owner does not always use the cash herself.

Finnish authorities can monitor the use of cash as a means of payment quite closely, for example, cash received by retailers. Based on transactions registered in cash registers, the amount of cash payments has decreased steadily and the growth of card payments has accelerated at Finnish payment points (Figure 2).

Cash's dual role as a means of payment and an asset that holds purchasing power in a highly liquid form should be apparent, yet information on cash savings is scarce and surveys fail to provide a reliable picture. Moreover, when Finland joined the euro in 1999, the Bank of Finland's cash issuance changed completely. The euro is an international currency used outside Finland. Finnish tourists can take euro banknotes abroad and use them in many countries. Foreign tourists can also use their euro banknotes in Finland. Moreover, after the US dollar, the euro is the world's second most important cash-saving currency outside the euro area.

The net amount of cash issued by the Bank of Finland (mainly euro banknotes) is quite heavily exported outside Finland in travelers' wallets. For this reason, the banknotes put into circulation by Bank of Finland has increased continuously, even as the use of cash in Finland gradually dwindles. Thus, the issuance of cash may not have a direct link to the use of cash as a means of payment in the home country, especially in the case of international cash currencies.

Trade payment statistics show cash issuance has grown steadily in the euro era. Growth in the issuance of banknotes has focused on the largest-denomination banknote that can be withdrawn from ATMs – the €50 banknote. It is withdrawn in abundance as a travel currency. It is possible to make domestic cash payments with a relatively small amount of banknotes if the circulation of cash to the central bank or the recycling by monetary financial institutions (MFIs) is efficient.

While all cash withdrawn from a central bank in principle has a purpose, this purpose is not necessarily making domestic payments. On a net basis, the bulk of issued cash is

spent in Finland, but a significant part is also taken abroad. This can be estimated using travel statistics, where travel expenditure to different countries is broken down into business and leisure travel. Much of the more detailed background information on the use of cash at payment points comes from the largest trade groups in Finland (S- and K-trade groups) and primarily from their grocery trade activities. An increasing share of consumer spending and private consumption, and thus of commerce and payment, has shifted to e-commerce, where the cash payment option is unavailable.

Although the use of cash has expanded for Finns in tourism, the use of domestic cash as a means of payment has decreased recently due to faster, easier to use and most recently convenient near-field communication (NFC) card payments. Purchasing and using cash requires more planning. On a practical level, the size of one's wallet limits the amount of cash one can carry, not to mention the room needed to hold change. Indeed, a reason for the decline in the popularity of cash is the inconvenience of carrying around large amounts of change in one's wallet coupled with dwindling opportunities to quickly dispose of that change in a subsequent payment. On the other hand, many people still value the concreteness of using cash in a transaction and the associated budget management that comes with it. People may find paying in cash makes it easier for keeping track of their personal finances than card payments. In any case, payment methods are still undergoing rapid and fragmented change.

The use of cash in retail payments in Finland has halved from an estimated value of more than €30 billion at the beginning of the euro era to less than €14 billion in 2018 (Figure 2). In 2018, more than €51 billion in card payments were made in Finland. The issuance of cash in Finland, on the other hand, has seen robust growth because cash is taken out of the country for tourism, mainly in the euro area. It is not necessary to return such euro cash to Finland through the banking system as during during the Finnish markka regime. Domestic cash savings, previously held in markka and foreign currencies, have also shifted primarily to the euro. While the monitoring of cash withdrawals from ATMs, bank branches and shops is technically straightforward, that cash may then be used in unmonitored interpersonal payments and make its way into the grey economy.

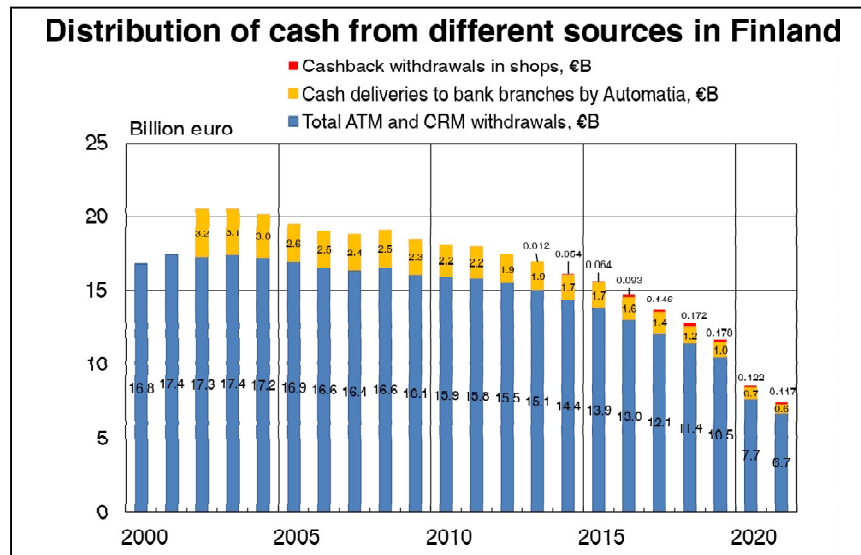
When queried about the importance of anonymity in the Bank of Finland's (BoF) consumer surveys, only a tiny percentage of Finnish consumers mention anonymity as a basis for choosing a payment method (Table 1). In Germany and elsewhere in the euro area, the importance of anonymity in payments appears to be considerably greater (e.g. Eschelbach M. and Schneider, F, 2020).

Anonymity is typically not an issue, even in the grey economy, as the cash payment usually involves a face-to-face transaction. Moreover, the anonymity of a cash payment is irrelevant to a payee seeking to disguise the transaction by not recording the payment as sales revenue. To this end, Finland enacted in 2013 a law obliging sellers to provide receipts as a deterrent to grey economy transactions.

Table 1: BoF consumer questionnaires (2007–2020) on reasons for using cash

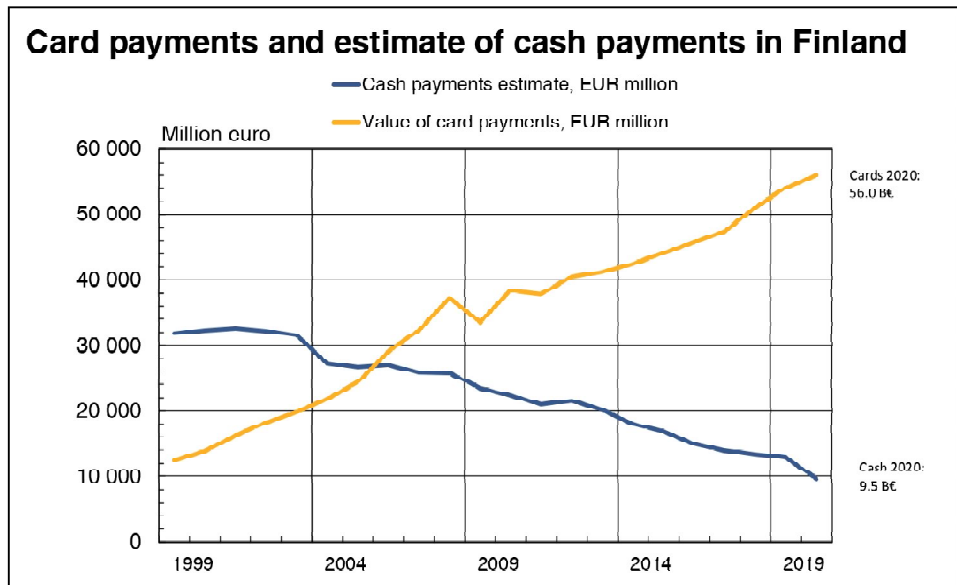
	2007	2014	2016	2018	2019	2020
	%	%	%	%	%	%
The possibilities of cash usage are wider	13	7	6	5	3	3
Use of cash is fluent and quick	19	13	10	5	4	5
Usage of cash is anonymous	1	2	2	3	1	1
Use of cash stays better in control	13	11	8	11	7	5
Cash is suitable also for personal money transfers	2	5	8	7	11	10
Cash withdrawals from ATMs are free-of-charge	1	0	1	0	0	1
Cash is suitable for small payments	25	27	33	19	18	16
Use of cash is safer in small amounts	2	4	2	3	3	2
I happened to have cash/withdrawn from ATM		18	13	14	12	16
Habit or custom, do not want to pay with card	6	6	7	2	3	3
Card payment is not available (for instance with market trade)	7	22	17	27	32	32
Card/card reader does not function		1			0	0
Gasoline/bensin with cash		1			0	0
Happened to have cash with/in wallet			3	7	8	7
Does not have card/do not own card			2	0	1	7
Cash used abroad/on holidays			1	3	4	2
Other reason/Cannot say	12	8	19	20	17	27
<i>Note! In the 2014 - 2020 questionnaire several answers were allowed.</i>	100	125	132	126	124	137

Source: Bank of Finland Consumer questionnaires, various years.



Sources: ATM companies, Automatia and Retail chains and S-bank.

Figure 1: Cash distribution in Finland 2000–2021



Source: Finance Finland and Bank of Finland.

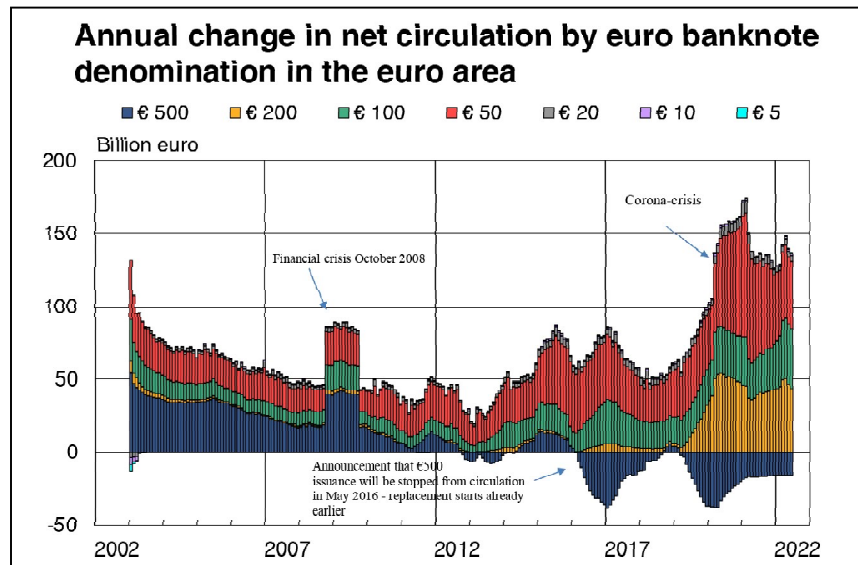
Figure 2: Cash payments and retail card payments in Finland

The possibilities for not reporting cash payments as operating income are becoming marginalized for other reasons as well. The share of cash payments has decreased in several industries. Paying for the purchase of materials in cash still results in the declaration of the purchase in the calculation of VAT. In rather rare situations cash can be used to pay for material purchases. The use of cash in purchases of goods and raw materials persists in Finland today, mostly in restaurants and the construction sector (NETS, 2018). In practice, cash has played a large role in the grey economy only in the payment of wages for undeclared work, creating a situation where income must be received in cash. Cash use is easier in the grey economy in trades where income is received and acquisition costs are paid in cash, i.e. a buy-and-sell trade.

Capping of cash payments could work to prevent the grey economy only in the event of non-disclosure of cash sales. Restrictions on illegal activities can be achieved through bans on cash payments and the abolition of larger banknote values. However, such restrictions can easily be circumvented by switching to smaller banknotes of the same currency, other currencies or the use of virtual currencies, so they are virtually ineffective in practice.

The 2016 decision by the ECB's Governing Council to cease issuance of the €500 banknote in the euro area was triggered by suspicions of its extensive use in the grey economy and in financing terrorist groups. Initially, €500 banknotes were exchanged for €100, €50 and €200 banknotes, but during 2018 the exchange operation slowed and turned

back into positive net demand in 2018. The €500 banknote is widely regarded as a cash-saving asset outside the euro area (Figure 3). A recent study found that €500 banknotes are not specifically linked to the functioning of the informal economy.



Source: European Central Bank.

Figure 3: Conversion of €500 banknotes to smaller banknotes in the euro area

Since 2010, €500 banknotes have not been available from banks in the UK and their convertibility has been limited. The policy is intended to limit the use of such banknotes in tax evasion. In practice, it is difficult to verify or observe whether the cessation of issuing €500 banknotes has had any statistically significant effect on the functioning of the grey or criminal economy. Since the global financial crisis, €500 banknotes have been acquired by banks in several euro countries to avoid the impact of negative central bank interest rates. The abolition of the €500 banknote cannot even be expected to have an impact on terrorism or its financing, as well as on the acquisition of weapons. Moreover, many forms of terrorism are rather inexpensive to implement (ESTA, 2017).

Within the EU's single currency area, large euro amounts can be transferred without restriction and without an obligation to notify national authorities. It is only when moving money out of the EU or into the euro area that transfers exceeding €10,000 must be reported. With the emergence of virtual currencies since 2009, some forms of criminal activity have shifted to the use of cryptocurrencies. This is primarily due to the fact that cryptocurrencies offer greater anonymity than cash and can be used to pay for illegal transactions online. If a wallet is created for a single crypto transaction, i.e. used only once as a separate payment not involving a cryptocurrency exchange, it is almost impossible to track down the person who made the payment.

A study published in February 2018 estimated that as much as 44 % percent of bitcoin payments were specifically related to the criminal economy.⁴ Notably, the use of bitcoins has not spread to the legitimate grocery trade as the cost of paying with bitcoins or some other cryptocurrency is clearly more expensive than current electronic payment methods and payment verification is clearly slower. Moreover, legal traders have to pay their salaries and taxes in official currencies, so bitcoins have to be converted into official currencies anyway.

3. Measuring the size of the grey economy

There is no generally accepted definition of the grey economy, but a common feature is that the grey economy refers to the production of goods or services deliberately concealed from the authorities to avoid financial obligations or other disadvantages.

For instance, the sale of sex are not illegal in most EU countries, but many EU countries ban brothel-keeping. In Finland, the provision of sexual services is permitted, but human trafficking and offering consideration for sex with a minor is proscribed. Street prostitution is also prohibited in Finland under the Public Order Act, which seeks to limit the visibility of the sex trade. Different practices affect the willingness to pay taxes. In a sex trade, neither party has a particular interest in reporting the trade, requiring a receipt, or getting a warranty.

Variations in VAT and other corporate taxation across the euro area also affect each country's exposure to the grey economy. The scope and size of VAT has moral and social implications, but here we keep to the economic implications. In Germany, the Netherlands, Austria, Switzerland, and several other countries, the prevailing view is better to bring activities that cannot be eradicated into the official domain where they can be regulated for the sake of public health and other considerations. In the case of brothels, for instance, the state stands both promote public health and generate tax revenue. Similar thinking is now influencing drug use policies, where partial legalization is seen as a superior approach to mitigating health damage and drug-related crime (Table 2).

Grey economic activity is difficult to measure precisely because those involved seek to evade official scrutiny. Finland follows a two-prong approach in quantifying grey economic activity in the national accounts approach (Statistics Finland, 2016, p. 322). The first step is to create a comprehensive picture of productive activities not included in the register that have been left out of the GDP calculations. When measuring the fiscal grey economy, the aim is to estimate the amount of taxable income excluded from taxation. Notably, the scope of the traditional definition of fiscal grey economy only extends to *legitimate* economic activity that takes place without the knowledge of the authorities or the income from such activity that is otherwise concealed to avoid taxes and charges. Assessments under this fiscal definition seek to measure potential tax revenue lost to the grey economy.

Table 2: Classification of grey and illegal (black) economy

	Economic crime	Grey economy	Illegal economy
Goods and services production	Legal	Legal	Illegal
Statistics and accounting	Not always included into accounting, may include international capital	May appear as tax deduction, camouflaged to other type of income	Is partly missing from National Account Statistics and GDP
Operational activity legality	Illegal	Tax evasion i.e. illegal	Criminal activity is illegal and in terms of taxation mostly tax evasion
Forms of action	Fake invoicing, corporate fraud, receipt swap, hidden dividends, false transfer pricing	Unreported labour and wages, hidden fringe benefits, unannounced VAT-taxes	Drugs trade, sales of stolen goods, smuggling, human trade, pimping, medicine and doping sales
Concepts:	<p>Economic crime is criminal activity, which has economic consequences that are related to profit seeking in favour of company or for another organisation. In this classification economic crime is internal, but it is not always known by the company leadership.</p> <p>Grey economy is activity of the company itself or activity of the company owners towards tax authority and towards society. This activity is illegal tax evasion according to tax laws.</p> <p>Criminal economic activity is trading of such products or services, which are not legal in jurisdiction like drugs and doping.</p>		

However, as the goal in compiling is in Finland's national accounts, it is also necessary to identify the realized share of activities occurring in the grey economy. In the national economy, the grey economy refers to productive activity *omitted* from the national accounts and *excluded* from GDP calculations. The tax administration has also defined the activities of the grey economy more precisely than before, so it is possible to define more precisely the boundaries of legal and illegal activities in terms of various definitions and activities.

Finland's law establishing the Grey Economy Information Unit (1207/2010) defines the grey economy as an activity that results in a breach of statutory obligations to avoid paying taxes, statutory pension contributions, accident and unemployment insurance, and customs duties, as well as fraudulent attempts to get an unjustified refund. The operation of the grey economy varies from industry to industry, so its nature needs to be clarified for each industry or branch. Although the grey economy is popularly understood as a broader phenomenon that includes, for example, actions of a natural person to avoid taxes, the grey economy under this law refers exclusively to grey economy-related business activities. This limited concept of the grey economy is further distinguished from the illegal economy, which means the economic added value generated by activity that is criminal from the outset. Such activities include, for example, illicit trafficking in illicit psychotropic drugs or proscribed substances, used to enhance athletic performance. While grey and illegal economy are largely overlapping concepts, from the point of view of tax evasion, a distinction between legal and inherently criminal economic activity is drawn.

Money laundering refers to the concealment or disguise of the identity of the recipient, sender, or both, of the proceeds of illicit transactions, as well as disguising of the origin of the proceeds to make them appear to be legally obtain so as to disguise their true origin or beneficial owner.

The *tax gap* is the difference between the theoretical tax receivable and the actual payments received. The tax deficit describes how well a company's tax liability has been met. The tax deficit is therefore the difference between the statutory tax accrual and the tax accrual paid.

The *VAT deficit* is result of deducting the actual VAT accrued from the statutory VAT accrual. Tax deficits can imply operation of the grey economy, but they can also arise unintentionally, for example, in connection with bankruptcies.

Accepting the economic benefits of certain *criminal activities*, otherwise punishable by law (e.g. drug trafficking, certain forms of prostitution) is also treated as tax evasion. Other criminal activities such as violent crime (e.g. battery) may not have tax consequences, so they are not counted as grey economy activities (Figure 4). Different forms of grey economy income types are described in Figure 4.

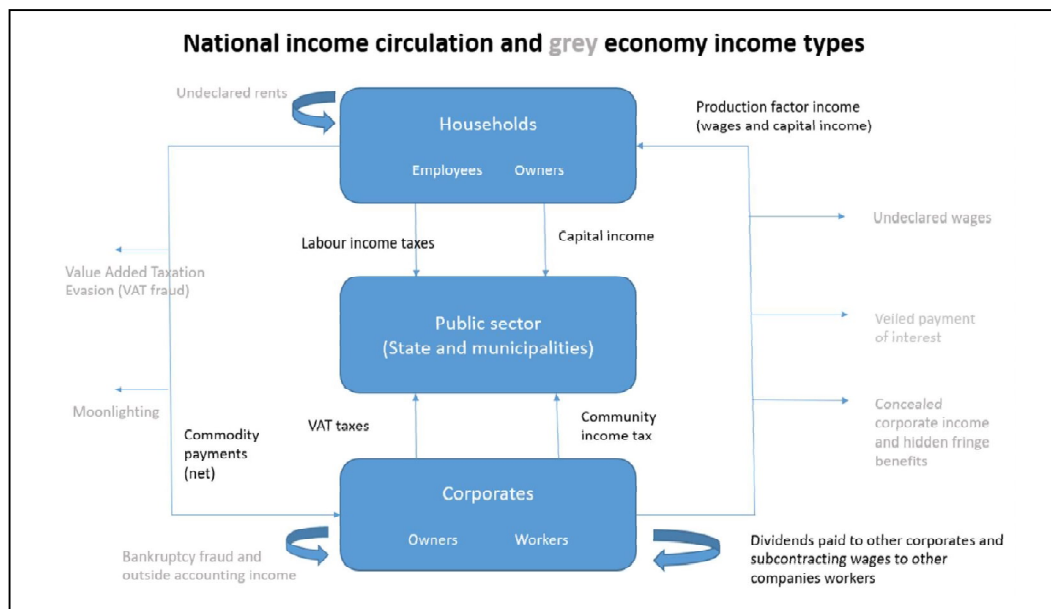


Figure 4: Grey sector income types in economic circulation

Both direct and indirect methods are used to measure the grey economy. Direct methods seek to measure the prevalence of the informal economy through surveys, interviews, or tax audits. This often cumbersome way of finding out the real situation may explain why it is rare, especially in international comparisons.

Indirect methods, on the other hand, seek to estimate the amount of an invisible phenomenon (grey economy in this case) on basis of indicators such as the demand for cash or electricity consumption. A well-known indirect method involves the use of a multiple-indicator multiple-cause (MIMIC) model. Multivariate methods seeks to measure the size of the informal economy using a number of potential informants (background causes) of the informal economy and indicators (consequences) describing outcomes from such economic activity.

Indirect modelling to estimate the size of the grey economy has been rightly criticized for a number of reasons. First, statistical modelling, like factor analysis, looks for explanatory factors for the grey economy from large number of explanations that may have a tenuous connection to the grey economy, making the model estimation unstable. Breusch (2005a) criticizes the MIMIC method for both its methodological and statistical failings. In his work on the Canadian economy, Breusch (2005b) notes that the results of model estimates do not correspond to general observations of a change in the grey economy, but only reflect inflation and growth in economic variables. MIMIC estimates often demand iterative fits, documentation, and verification when their relationship to reality is unclear and their unambiguity is questionable. Indeed, how stable can the relationship of these indicators be when the grey economy as a whole is already hidden and the tax authorities further seek to minimize its existence.

As an example, changes in cash savings and hoarding are easily attributed to the grey economy when there are no other apparent economic reasons for such behavior. Even if the effort is good, excessive assumptions instead of actual measured facts erode the credibility of such modelling. MIMIC modelling systematically produces strangely high estimates of the grey economy, even for effectively managed countries. Moreover, automation of corporate taxation or other tax administration measures are not significantly reflected in the results obtained or their changes. The high efficiency of public administration and tax collection in some countries is also barely reflected in the size of the grey economy. Indeed, MIMIC-model estimates for Nordic grey economies fall in the same ballpark with the grey economies of some countries in central and southern Europe. In general, the reproducibility and objectivity of the method as a scientific result have been questioned.⁵

In the past, the size of the grey economy was measured according to cash issuance as cash was seen to enable grey economy functions. An increase in the demand for cash not directly related to economic activity (mainly private consumption) was interpreted as a sign of an increase in the use of cash in the grey economy (Cagan, 1958). Intuitively, changes in taxation policy that led to an increase in the demand for cash were seen as a sign of increased tax evasion. Even if high taxation rates increase the motivation to evade taxes, efficient Nordic tax administration tends to make this impossible. This theory also overlooks the fact that the use of cash may vary for reasons other than taxation.

The motivation to use cash for saving depends on interest rates and income growth, with taxation explaining possibly some of the potential demand for cash. Confidence in the public sector and the banking system in Nordic countries is high so concerns over bank runs or major cyberattacks are normally not at issue. The dependence between the cash and the grey economy can be complex and variable over time. Even if cash had a clearer link to the grey economy in the past, this dependence has eased through the reduction of electronic payment methods and accounting systems and the use of cash. A more sophisticated and balanced way to measure the relationship between cash use and the grey economy is to use economic econometric models to look for dependence that seek natural explanations for the use of the cash grey economy and try to form effective explanatory variables for them. This approach was pioneered in the US by Tanzi (1980, 1982).

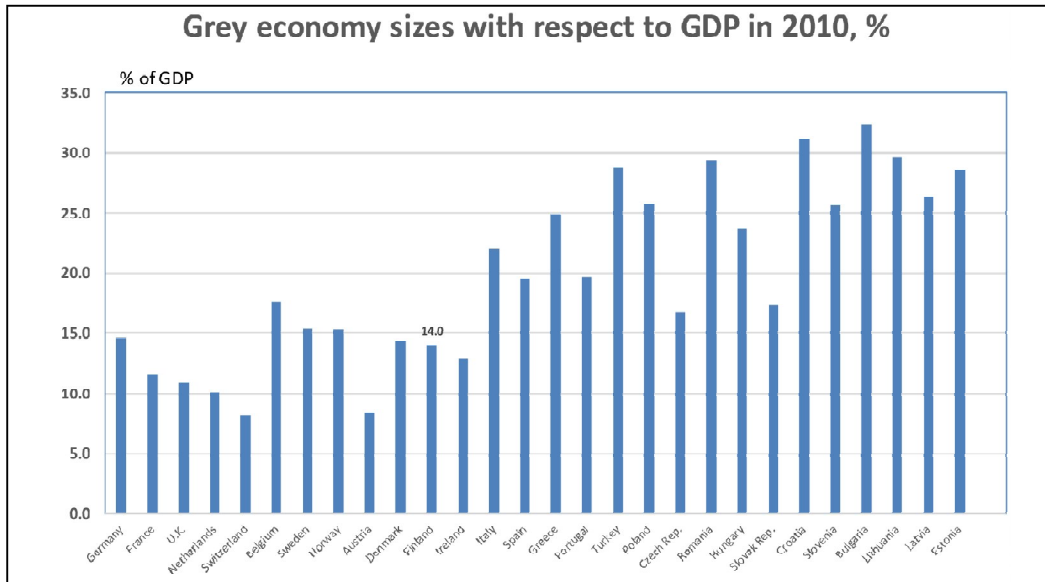
The main challenge in building MIMIC models is that there is no clear indicator of the size of the grey economy, i.e. the phenomenon that can be explained by itself. The grey economy found in tax administration statistics, for example, depends crucially on tax audits, the timing of audits, the timing of new tax laws and their introduction, resourcing, etc. A coherent time series of the phenomenon cannot be easily formed, i.e. the chances of finding dynamic economic dependencies are weak. Also, if we invest in finding the grey economy, then there tends to be more of it. It is also unclear why the relationship of the various explanators of the grey economy to the grey economy itself would remain in any way stable. The activities of the grey economy are disguised, the development of new tax evasion activities, in much the same way as criminal economic activities. Legislation is being sought to correct and prevent tax evasion in advance and in response to tax evasion, so the situation is evolving over time.

The issuance of cash during the euro era has clearly changed in almost all euro area countries. It has created a large single currency area that has led to massive cumulative changes in the issuance of cash in some euro area countries. In Germany, for example, the issuance of euro cash or cash deliveries outside the euro area has increased significantly (e.g. to eastern Europe), although domestic cash use has remained relatively stable and the use of payment instruments accounts for only a small share of cash issuance.

In Finland, on the other hand, the issuance of cash has grown steadily, apparently mainly due to Finnish tourism exports (holiday and business tourism) largely to other euro area countries but also to non-euro area countries. Tourist flows bring more euro banknotes to southern European countries than their own issued volume.

As noted, recent international studies put the size of Finland's grey economy at around 15 % of GDP. These calculations have mostly been made using the MIMIC method, where estimates of the grey economy size are based on a set of macroeconomic variables. These calculations show also similar 15 % grey economy size estimate for Germany and about 25 % for Greece. More moderate OECD studies put the size of Finland's grey economy at just over 4% in the 1990s. However, in several international model comparisons of Finland,

Sweden and Germany, the size of the grey economy has been estimated to be in the order of 14–17 % of total output (Figure 5).



Source: Friedrich Schneider, Johannes Kepler University of Linz, Austria; A.T. Kearney analysis VISA 2015.

Figure 5: Size estimates of European grey economies, %.

These high estimates of the grey economy do not line up with Finland's (or the other Nordic countries') particularly concentrated production and trade structure, or in relation to its corporate structures in general. The amount of cash wages in Finland is quite small, and the tax payment to the average employee is largely automated and often transferred to the employers' declaration responsibility. The efficiency of public administration, as measured by Legatum Prosperity Index governance category, is the highest in the world.⁶

In Finland, the share of smaller entrepreneurs and independent retailers has remained small. There are fewer micro-enterprises in Finland with less than 10 employees than the OECD average. The automation of payment systems has also long been very high in retail. Finland and the other Nordic countries are also the least corrupt countries in the world.⁷ There is also very little organized crime in Finland.⁸ One would expect these distinctive features of the Finnish economy to be well reflected in international comparisons.

This study draws on different statistical sources and observations on the grey economy and the issues that affect it in order estimate the magnitude of grey economy. It further aims is to produce an estimate of the maximum share of cash used in the grey economy.

Some phenomena of the grey economy are omitted in this analysis. For example, the largest items in the grey economy survey submitted to Finnish parliament in 2010 largest

economy were investments in tax havens. The report put conservative estimates of tax haven investment income in 2008 at €700 million. That report further estimated the size of the grey economy at that time to be as large as €12.1 billion, or 6.9 % of gross national income at the time. Other domestic estimates (e.g. Statistics Finland) put the size of the grey economy are significantly lower. However, the scope and thoroughness of this the report on the grey economy submitted to the Finnish parliament is a comprehensive survey of the assessment of the manifestations and size of the grey economy with tax audit data, but its overall estimate of the size of the grey economy is estimated at the maximum possible.

Virén (2013) has criticized the research on the grey economy submitted to Finland's parliament. Raising the calculations made by the tax administration through tax audits to the level of the whole economy is erroneous when using turnover classes only. As a result, the estimates of the size of the grey economy are excessive. Part of the misconception arises from the improper assumption that the companies selected for tax administration inspections are a representative sample of all companies. In reality, tax audits do not target all companies completely at random, but primarily companies suspected of tax evasion and crime. The sample is therefore strongly selected. Indeed, too many random tax inspections would simply waste public resources. Random selection only need on a limited basis to control the efficiency of sample selection.

This problem is mentioned in the Parliamentary Report on the Grey Economy, but its statistical consequences were never fully controlled. In his reply to Virén, the head of the parliamentary group suggested that companies in the tax administration's tax audits would be a rather random sample and close to the key figures of all companies (Hirvonen, 2013). However, the difference between tax audited and all companies is significant. The tax administration not only removes companies from the register for inspection, but companies under inspection are usually there for a clear reason such as unclear company ownership, previous tax inspections, disruptive behavior, notifications, reported flaws or foreign operations.

The second estimate of the size of the grey and illegal economy published in Finland is included in Statistics Finland's estimate of the hidden economy in Finland in 2006. Nurminen (2008) estimates the size of the grey and illegal economy to be just over 1 % of GDP. Statistics Finland regularly assesses the size of the grey and criminal economies, as well as the hidden economy, when estimating the coverage and statistical gaps in GDP calculations. The last such comprehensive review of GNI calculations was published in 2016.

These studies provide the methodological basis for this study, which combines materials from both studies and official statistical sources. The purpose of this study is to bracket the magnitude of tax evasion in the national economy and the involvement of cash in the processes of the grey economy. The informal grey economy and the use of cash in the grey economy of these industries are assessed in this report as follows:

The communities' payroll, corporate income and dividends, as well as net sales after VAT for 2017, are obtained from Statistics Finland's and the Finnish Tax Administration's industry statistics. A direct industry survey provides more certainty for estimating the size of the grey economy than indirect statistical estimates.

The same industry breakdown and grey economy shares was used in the assessment of the share of the grey economy in the Hirvonen, Lith, and Walden (2010) report to parliament, which primarily concerned 2008. These sectoral shares of the grey economy are based on the Finnish Tax Administration's tax audits. As discussed above, these proportions are likely to be somewhat exaggerated. Figures from this grey economy report are used because more recent industry figures are not directly available elsewhere.

As mentioned, the Hirvonen *et al.* (2010) estimates of the share of the grey economy can also be considered overestimates due to the introduction of laws and other measures restricting the grey economy in the 2010s, as well as the decisive decline in cash sales and wages over the past decade. As there is no way to tease out the exact size of the bias, this estimates here represent the maximum size of the Finnish grey economy.

In this study the sectoral analyzes of the grey economy have been conducted through both the production and income statistics of enterprises and the consumer goods groups of private consumption demand in households. In this way, an estimate of the size of the grey economy in Finland, calculated in two ways independently, has been obtained.

As the intention is also to investigate the share of cash use in the grey economy, these analyses have been carried out by industry. Payment method surveys for 2017 published by the Bank of Finland (2018), NETS (2018) and the European Central Bank, provide survey data on cash payments received by companies, as well as on cash sales in different industries and the use of cash in different consumer goods groups. The potential use of cash in grey economy operations depends on the industry's cash sales, other cash payments received, and the possibility of paying salaries in cash. Due to the nature of the phenomenon, an exact truth about the use of cash in the grey economy cannot be obtained, but some understanding of the magnitude of tax evasion in the grey economy can be achieved.

Based on previous research data, it has become clear that the activities of the grey economy in Finland are concentrated in certain industries, and there is more direct and indirect information on the extent of tax evasion in these industries. Thus, there is also a more intuitive basis for evaluating the grey economy than for results obtained through various models. It is more difficult to be sure of the realism of multivariate methods than of industry-specific euro amounts and shares. However, it must be borne in mind that the measurement of the grey economy is quite different from that of other public economic activities that are not deliberately opaque.

4. The Role of Cash in the Grey Economy

Cash is often associated with the grey economy in different ways as the use of cash is usually anonymous and there is no direct electronic recording of the cash transaction. Cash payments

are typically recorded separately into the merchant's electronic cash and accounting systems. In companies engaging in grey economy activities, cash may be used to pay undeclared wages, but tax evasion through fake receipts and disguised dividends is mostly done with electronic means. A range of regulatory measures in Finland have reduced the possibility of paying undeclared wages in cash significantly since 2010. In criminal activities, cash is apparently used for payments, safekeeping of assets and the transfer of funds.

In combating the grey economy, it is essential on the business side to prevent the use of undeclared work and limit by-sales in trade. Combating financial crime such as the use of undercover companies, the creation of fake receipts or money laundering, requires different means. However, grey economy activity is likely to manifest in electronic payments than cash transactions.

A 2015 Europol report makes six salient points about the importance and contribution of cash in the grey economy (Europol 2015, p. 7):

- Cash enables criminal tax evasion by acting as the *main means of payment* in criminal activities.
- Although cash is also used legally, *all criminals use cash at some point in the money laundering process.*
- Despite the rise in cybercrime, fraud and illegal e-commerce, *cash remains the main tool for money laundering.*
- *The smuggling of physical cash has maintained its position as a key means of transferring money in the criminal economy, with €1.5 billion of cash found or confiscated by public authorities in the EU each year.*
- In the case of cash, *remittances sent by post or remittance companies are partly beyond the control of the authorities.* Cash movements are more difficult to trace than electronic payments, a situation reminiscent of the exchange of gold and other precious metals.
- *The use of higher banknote values is largely unknown.*

Europol's estimate is based on empirical experience, but no real statistical research evidence is provided on the role of cash in the grey economy. To be able to assess the use of cash in terms of the grey economy, we need to look at the following key issues:

- Why and how is cash used in the grey economy?
- Which industries in Finland's grey economy use cash?
- What is the share of the grey economy and its use of cash in different industries?
- What alternative means of restricting the grey economy are more effective than restricting the use of cash?

In the following, an attempt will be made to outline this broad entity and assess whether there are still some additional opportunities to limit the operation of cash as an aid to the grey economy as well.

Restrictions on cash payments have been concluded in economies with very different payment environments compared to Finland. With exception of Denmark, there are no cash payment restrictions in the Nordic countries or central Europe (Germany, Austria, the Netherlands, Belgium). The role of cash use in Finland’s grey economy was last extensively examined in a working group set up by the Ministry of Employment and the Economy in 2014. That group proposed no new restrictions on the use of cash because more effective means were available.

With the decrease in the use of cash as a means of payment in Finland and the other Nordic countries, its role in the operation of the grey economy has logically decreased accordingly. This is not the only significant issue, however. Legislation and other measures implement in Finland over the past decade have effectively restricted the activities of the grey economy. Furthermore, in Finland, as in the other Nordic countries, the size of the grey economy is clearly an order of magnitude smaller than in southern Europe, where cash payments account for close to 80 % of retail payments and the efficiency of administration and tax collection is lower. Finland has the most efficient public administration in the world and little corruption.⁹ Electronic card payments clearly dominate retail payments, so the opportunities for the grey economy in Finland are clearly smaller than in most countries.

The procedure applied in this study is based on Finnish Tax Administration tax inspections and various other sources of official statistics from the National Accounts, taxation statistics and various surveys (Figure 6). Statistics Finland has also added estimates of prostitution and drugs spending since 2019 to its consumer expenditure statistics (Figure 7). The estimates are based on the assumption cash is mainly used to pay for drugs and prostitution.

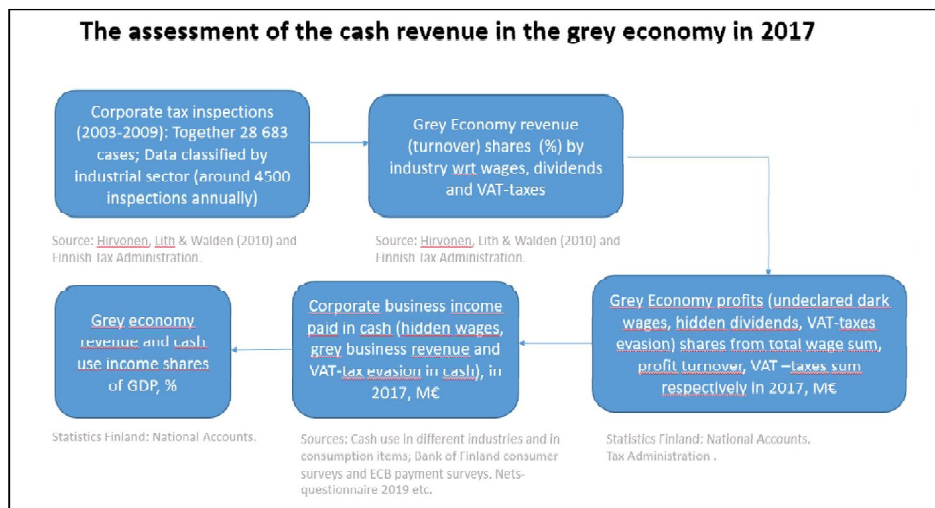


Figure 6: Procedures in assessing the grey economy and cash usage in the grey economy

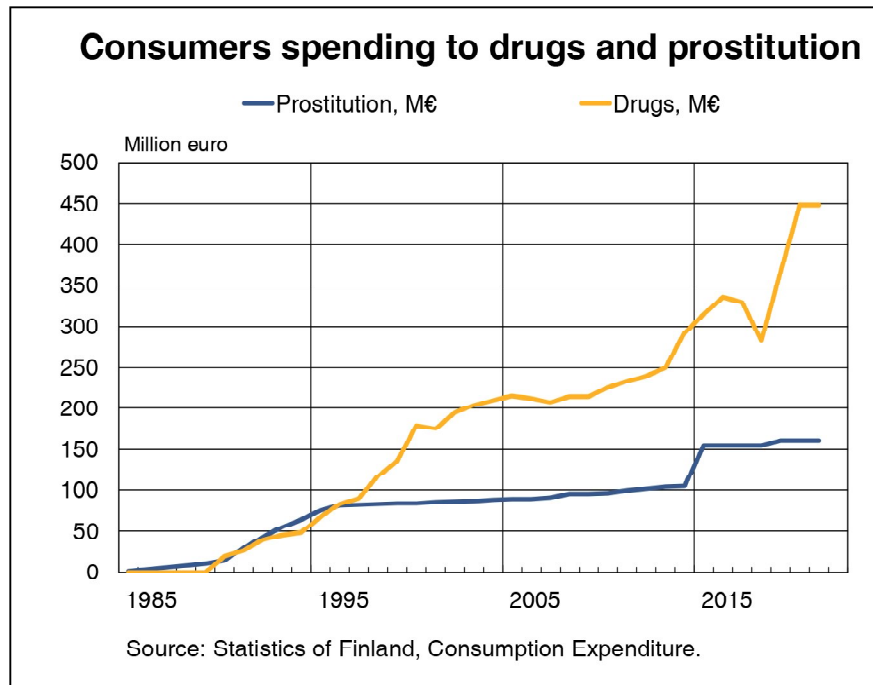


Figure 7: Spending on illicit drugs and prostitution in Finland 1995–2021

5. Estimation of the use of Cash in the Grey Economy

Only about 20 % of the grocery trade involved euro cash in Finland before the pandemic, which it itself limited possibilities for tax evasion with cash. The concentration of grocery sales and chaining are dominant features in Finland, so there are minimal incentives or opportunities for e.g. VAT evasion. Opportunities for tax evasion in large organizations are reduced, and the mere reputation risk limits the desire to even consider the operation of the grey economy. Cooperative businesses also lack the same financial incentives to operate in the grey economy as private profit-maximizing business. Finland’s largest retail chain group (S Group) is a cooperative business with a 46 % national market share of grocery sales.

The market share of the three largest trade groups (S Group, K Group, and Lidl) in terms of turnover in the grocery trade totaled 92% in 2018, and VAT is not practiced in other larger chains (Tokmanni, Stockmann, Minimani, etc.) for the reasons mentioned above. In 2017, half of all net state VAT tax revenue came from retail and wholesale trade. Sales in the grey economy were previously estimated in the 2010 business surveys to be around 5% in certain specialty trades (optics, goldsmiths, photography, healthcare) and slightly higher for sellers of home appliances and bookstores. VAT evasion has been

observed in 2010 mainly in only some areas of the grocery trade, including the sale of fruits and vegetables, confectionery sales, used car sales and car spare parts trade. Today, these industries are also largely chained as well, which has reduced the share of the grey economy in these special sectors as well.

In a study by Hirvonen *et al.* (2010, p. 50), the share of grey wages in the grocery trade in tax audits was less than 2%, compared to an average of 5.6% in all trade sectors. In addition, the share of hidden revenue in the grocery trade is miniscule. In the technical wholesale trade, the grey economy or the impact of the grey economy on the neutrality of competition was also not considered a significant issue in industry member company surveys conducted in 2010.

Thus, according to the above-mentioned surveys, the grey economy is not a major problem in the trade sector. Moreover, the share of declared, but unpaid, VAT was just 2.3% of total tax liabilities in 2010. Unpaid VAT in trade is most often the result of an inability, rather than a reluctance, to pay taxes. Tax debts trigger other inconveniences, including bankruptcy. Cash payments in transactions have been in constant decline throughout the euro era. Indeed, cash payment only remains significant in restaurant and café operations and in some transport services (e.g. taxis).

Table 3 shows the key figures for the concentration of typical industries and the grey economy in Finland. Of the industries, trade and transport are particularly concentrated and chained in Finland in terms of turnover and the industry's wage bill, which reduces their vulnerability to the grey economy. The concentration of business can be measured by the Herfindal Index. It also indicates a strong concentration of construction, trade, and

Table 3: Concentration of business activities in the whole economy and in typical grey economy industries in Finland in 2017

Turnover class, €	Whole economy				Construction turnover, M€	Wholesale & retail trade, M€	Transportation & storage, M€	Accommodation & food service, M€	Arts, entertainment & recreation, M€
	Companies	Personnel	Wages, M€	Turnover, M€					
0 - 39 000	170 673	112 637	3 711	1 964	177	202	44	41	79
40 000 - 99 000	69 613	42 186	604	4 534	799	509	416	147	118
100 000 - 399 000	71 319	119 080	3 299	14 215	2 423	2 278	1 492	1 002	0
400 000 - 1 999 000	36 675	228 117	8 176	31 973	5 400	7 478	2 697	1 908	436
2 000 000 - 9 999 000	12 209	262 998	10 562	51 133	7 263	15 727	3 457	1 434	489
10 000 000 - 39 999 000	2 893	205 333	8 993	55 092	5 578	16 572	3 436	889	322
40 000 000 - 199 999 000	878	208 498	9 628	71 110	4 860	18 491	4 320	0	272
200 000 000 -	254	274 104	13 135	181 126	9 733	56 363	7 777	0	0
Together	364 514	1 452 933	58 108	411 147	36 234	117 620	23 636	5 422	1 717
HERFINDAL index ³⁾				2648	1812	2965	2015	1544	230
Share of large (> 40 M€) companies turnover, % ³⁾				62.2	42.6	58.8	51.0		15.8
Large companies (> 40 M€) wage sum share, %				39.2	29.3	45.9	40.4		5.9

transport in Finland. The decline in the use of cash and the increase in the share of electronic payments will further reduce the role of cash in the grey economy.

- 1) The Herfindahl index, a measure of market concentration, is given here as percentage shares of companies in industrial sectors. Index values range from 0 to 10,000 and markets with scores above 1,800 are considered concentrated. The index is calculated by squaring the market share of each firm operating in the market and then summing the resulting numbers. The higher the numerical value of the Herfindahl index, the more concentrated the industry. Here, the index is calculated by revenue category.
- 2) EU classifications consider a company large if it has more than 250 employees and a turnover of more than €40 million (or a balance sheet total of more than €20 million).

The extent of the grey economy can be measured from the supply or production side of the economy or, alternatively, from the demand side through consumption groups. The use of the generated national income in the grey economy can be traced mainly to private consumption because public consumption cannot, even by definition, be a grey economy activity. Although, due to the equality of GDP identity, there is a grey economy on both the production and consumption sides, items from different sides cannot be directly summed up as it would double the share of the grey economy.

From the production side, the share of general government (consumption and investment) in GDP in Finland in 2017 was 27 %, which by definition not includes the grey economy, namely undeclared wages or VAT evasion. Finnish public social security expenditure, i.e. public sector income transfers and tax subsidies to companies, is the highest in the EU, about 25 % of GDP, does not include the grey economy. The share of the public sector and income transfers together was about 56 % of GDP in 2017 according to the OECD, which also restricts emergence of the grey sector size.¹⁰

The financial sector, which is not subject to VAT, covers about 15 % of GDP. The industry is dominated by large companies (around 10 % of GDP), where it would be possible to use very low wages and also very little VAT evasion in relation to turnover, as exporting companies recover VAT paid mainly in the form of tax refunds.

As stated above, retail and wholesale trade in Finland is highly concentrated. There is practically no grey economy activity in the large trade groups. Trade constituted about 10 % of GDP. Other retail trade in Finland is starting to be so chained (hotels, restaurants, fast food chains, gas stations, hardware stores, furniture stores, other services) further squeezing out the grey economy. There small entrepreneurs in Finland are relatively few, so the extent of the grey economy cannot be large in this respect either.

The advantage of large shop chains is cheaper material procurement through tenders and larger material order batches, leaving small companies few niches to fill or business opportunities to exploit. Some highly personal services (e.g. care sector, barbers,

hairdressers) seem to be the exception. This may be due to the nature of the industry's personal services and partly the outsourced demand risk (e.g. rental of barber chairs). With more than 80 % of euro-denominated retail sales already covered by electronic payments, there is little room left for the use in the grey economy. Cash is still used to some extent in transport, although the general change in payment methods has sharply reduced cash payments over the last couple of decades. In transport, the chaining of the industry e.g. has reduced the activity of the informal economy in regular freight transport due to better transport security.

The automation of tax systems and various financial statement indicators limit the opportunities for the grey economy to a few business areas in Finland. Moreover, the consumer usually determines the payment method, so the automation of payments in Finland also means fewer opportunities for the use of physical cash in tax evasion.

The most important production area of Finland's grey economy in euro terms is still construction. Significant steps were taken in the 2010s to limit the activity of the construction grey economy. The following measures have limited construction tax evasion:

- The Salary to the Bank Act of 2013
- Introduction of a mandatory identity card and electronic employee register in 2013.
- Increased use of the household deduction in personal taxation (2003–2014).
- Implementation of a reverse charge for the construction sector in 2012 and reformed reversing the tax liability back to the subscriber in 2017.
- Introduction of a site-specific electronic notification procedure to the tax administration of a construction site (2014).

The Finnish Construction Association reports that measures to combat the grey economy have paid off. Around 75 % of Finnish economists consider household reduction to be an effective way to combat the grey economy. Only 8 % disagree with this view.

In 2016, the Finnish government adopted a decision-in-principle on the strategy for combating the grey economy and financial crime for 2016–2020. The operational program included 20 projects. One of the projects was to investigate and monitor the regulatory burden of the grey economy and the fight against financial crime.

In business, the use of cash in the grey economy mainly focuses on the following activities:

- Unregistered construction workers in private construction.
- Housing or other building renovations exceeding the household deduction for households.
- The blackout of the cash trade due to VAT in activities such as restaurant sales, nursing services, market sales and flea market sales, where cash purchases and sales are high, but no receipts are offered.

- Direct sales of agricultural and other food products to customers (sales of self-picked berries and mushrooms are tax-free).
- Payment of salaries and rents in Finland in cash has been practically blocked since 2013.

6. Evaluation of the Grey Economy and the use of Cash in the Finnish Grey Economy

A reasonable statistical economic and fiscal assessment of the size of the grey economy requires reliable industry-specific estimates of the share of grey economy activity, combined with basic statistical data, i.e. business sector financial statements and national accounts data.

An overall assessment of the grey economy size was attempted in a 2010 study at the behest of the Finnish parliament. It was based on tax audits of the grey economy. Although this study suffered from minor shortcomings, tax audits are the best available frame of reference for investigating the grey economy. The Finnish Tax Administration's Grey Economy & Economic Crime Group has again extensively studied the effects of various legislative measures on the functioning of the grey economy in the 2010s. In the 2010s, the activities of the grey economy have been limited, at least in construction, freight transport, accommodation and entertainment, which have been subject to legal regulation and other follow-up measures. The Finnish Tax Administration reports that undeclared work has been on the rise again in recent years. Further, Finnish police indicated that drug trafficking has also been on the rise in recent years. Illicit drug sales and spending on prostitution services are included in the private consumption figures released by Statistics Finland.

In the following calculations, the size of the grey economy in 2017 is estimated in two stages, first assessing the size of the grey economy using industry-specific tax audits, followed by a separate assessment of the use of cash in the grey economy of different industries. The sectoral breakdown and procedure correspond to the audit calculations of the Hirvonen et al.(2010) report on the grey economy submitted to the Finnish parliament, which mainly reflects conditions in 2008.

As in the study of Hirvonen, Lith and Walden (2010), the production of the grey economy from the production side of the economy is examined with the help of the following three grey economy income items:

- hidden and undeclared wages,
- hidden income items and dividends, and
- avoided and unpaid VAT.

This study uses the shares of the grey economy from total tax audits to estimate the above income items in 2017. The purpose of this report is to calculate the maximum size of the grey economy as this calculation method involves three elements that *exaggerate* the share of the grey economy and cash use in the grey economy compared to previous research.

The first exaggerating element is that tax audits are likely to target companies where the grey economy is suspected and present. The second exaggerating element is the overlooking of the above-mentioned move away from cash in retail payments. The use of cash has declined by more than half over the past 15 years or so, reducing cash by-pass opportunities. Moreover, cash usually first has to be obtained from customers to pay cash wages and purchases of goods to temporary workers. The third exaggerating element is failure to account for the reduced the scope for the grey economy. Finland has implemented numerous laws and regulatory measures tailored to the risk areas of the grey economy, some of which specifically target the use of cash. The most important of these has been the Salary to the Bank Act, introduced in the summer of 2013. The law generally prohibits the payment of wages in cash, and allows cash wages only in compelling cases. In order to prevent VAT evasion in Finland, an obligation to provide a payment receipt was instituted. The measure is generally considered effective in reducing the possibilities to perform tax evasion in cashier tills.

The Ministry of Employment and the Economy's working group on cash payment restrictions ultimately did not propose the exclusive use of certain types of cash registers as in Sweden or a stronger receipt-production requirement. The reduced tax deficit and tax evasion reduction benefits were modest relative to the high cost of changing out legacy cash registers. The decision was also influenced by projections showing declining cash use in the grey economy as the use of cash as a means of payment in Finland will continue to decrease with the change in consumers' choice of payment method. In recent years, contactless NFC payments made with debit cards have accelerated the displacement of the use of cash also in small retail payments.

Any attempt to regulate cash use in the grey and criminal economy should be approached firstly with assessing the overall size of the grey economy in each sector. Only then should the assessment of the share of cash used in grey economy transactions be performed. After this policymakers can then consider if there is a need for further regulation.

6.1. The Grey Economy and the Payment of its Income in Cash

Table 4 summarizes the estimate of the size of the output of the economy, i.e. the grey economy on the corporate side. As mentioned above, the intention has been to calculate an estimate of the total size of the grey economy using the shares of the Hirvonen et al.2010 report on the grey economy by industry for the various income components of the grey economy (undeclared wages, hidden dividends and VAT evasion). Tax audits are used here to identify sectoral contributions to the grey economy and then raised to the level of the economy as a whole directly through wages, turnover or VAT revenue. In other words, industry-specific grey economy audits are assumed to describe the grey economy of unaudited companies as in the above-mentioned report, but the total size of the grey economy is aggregated by industry rather than turnover categories as in Hirvonen

et al. (2010, pp. 57–58) study. This provides estimates of the euro-denominated size of the grey economy in 2017. The sample has not been updated to 2017, however, as the statistical bias previously described would have simply reoccurred.

In the macroeconomic calculations for 2017, summing of the income items of the various grey economy puts to size of the grey economy a €3 billion, with about half coming from undeclared wages. According to recent data from the Finnish Tax Administration, the amount of undeclared wages detected in tax audits in 2018 totaled €42 million. Cash received from VAT evasion from the sales may have been used to pay undeclared wages.

The amount of recorded undeclared wages raised to the industry level means that is the largest industry in 2017 with the most undeclared wages was construction. Undeclared construction wages were estimated at €461 million, or 30 % of all undeclared wages that year.

Undeclared wages paid in cash in construction were estimated at €60 million, although it should be noted that, in principle, such payment should no longer exist under Finland's Salary to Bank Act of 2013. The law allows cash wages only in compelling cases. According to the ECB's extensive SPACE retail survey of July 2020, Finland and the Netherlands had anyway the lowest levels of cash wages in the euro area, but around 5% of Finnish consumers still reported receiving at least a quarter of their regular income in cash.

In euro terms, the grocery trade is Finland's largest retail trade industry. It employs more than 120,000 people. Over 90% of the grocery trade and the dominant share of sales is concentrated among three large trade groups. This situation virtually eliminates grey economy possibility or undeclared wages in the grocery trade. The largest retail groups (S and K groups) also have a wide range of other stores, such as restaurants, hotels, car and machinery stores, petrol-stations and other specialty retail chains, which also have virtually no grey economy, i.e. undeclared wages, hidden income, hidden dividends, or undeclared VAT. In small-scale trade such as market trade, the purchase and sale of private entrepreneurs have grey turnover and the use of cash on average, but its share in Finland is also declining today as the use of electronic payment terminals has grown rapidly. This has reduced the potential for tax evasion through cash.

For example, cafes, specialty stores, pizzerias and fast food outlets, and many other areas of trade are chained. Numerous foreign retail chains have also entered Finland for various trade sectors. However, the supply of cash in the grey economy is limited by the fact that the cash again must first be acquired through e.g. customer payments to be used in tax evasion. Companies order cash changeover services from security firms specialized in cash-in-transit services, but also use bank branches to a lesser extent (e.g. cash drops). Larger banknotes and larger amounts of cash must be obtained from bank branches. The amount of cash delivered to bank branches in Finland has fallen to just over €1 billion a year in recent years.

The use of cash in business and its grey activities has thus decreased over the last decade related to systematic regulation and targeted measures, which have been the subject

of numerous background studies and impact analyzes by the Finnish Tax Administration's Grey Economy Information Unit. The use of cash in Finnish grey business operations has also decreased overall (dark wages, hidden business income and avoided VAT revenue) and its value has been estimated at just €320 million.

However, as estimates of the use of cash in the grey economy are always uncertain because the activity is specifically intended to conceal, the calculations have also included a sensitivity analysis by varying the assumptions about the share of cash in the grey economy. In the background calculations, the amount for the assumption that half of *under-the-table wages* in the business economy are paid in cash, giving the estimated total *black* and criminal economy wages of €423 million, with salaries increasing by €766 million. However, these calculations show that estimates of the corporate use of cash in the grey economy ultimately represents a rather small part of total cash use, which in 2017 was still almost €14 billion based on the amount of cash withdrawals.¹¹

On the production side of the economy, grey economy activity in relation to the wage bill remains at 5.2 % (Table 4). The share of the grey economy in productive activity as a share of GDP remains at 1.8 %, which is clearly less than the estimate of nearly 7% of the grey economy report submitted to parliament almost a decade ago (although the calculations mainly use the sectoral shares of the grey economy from tax audits in this previous report).

This study also separately assesses the role and importance of cash in the grey economy. We estimate cash under-the-table (undeclared or dark) wages, business income and the VAT deficit together correspond to 0.4 % of GDP. If the use of cash in the grey economy totals less than €1 billion, then the share can be considered quite small compared to Finland's total 2017 GDP of €223 billion. In this way, we conclude that no more than 10 % of the total use of cash can be related to wages paid under the table.

In addition to under-the-table wages, the share of the grey market and estimates of the use of cash by industry have also been calculated for corporate income and hidden dividends. In the case of these accounting items, the use of cash is usually not obvious in any way, it is estimated that just over €255 million. Typically, these items are accounting income that is distributed to owners as capital income that is more lightly taxed than earned income.

Similarly, the proceeds of VAT evasion are not normally realized in cash. Although the total tax evasion related to VAT taxation is estimated in the calculation at €1.14 billion. It is estimated that it will be realized in cash in the amount of approximately €73 million. Due to the nature of business activities, the main industries involved in VAT evasion are construction, retail trade, and freight transport.

The size of the grey economy based on the industry classification of companies has been reviewed above. As such, a sectoral analysis improves the accuracy of the assessment of the share of the grey economy as a whole by bringing proportionality to the review. Estimates of the use of cash are more subjective, but they take advantage of the industry's turnover, cash use shares, and typical cash payment shares of various commodities, as

well as consumer surveys of the Bank of Finland, NETS, and the ECB. While these estimates may not be particularly accurate, the magnitude of the estimates is sufficient to provide policy guidance.

6.2. Evaluation of the Grey Economy and the use of Cash using Consumption Statistics

The scope of the grey economy can also be approached methodologically from the demand side of the economy, i.e. through private consumption. Public consumption is not assumed to be associated with the grey economy in this context.

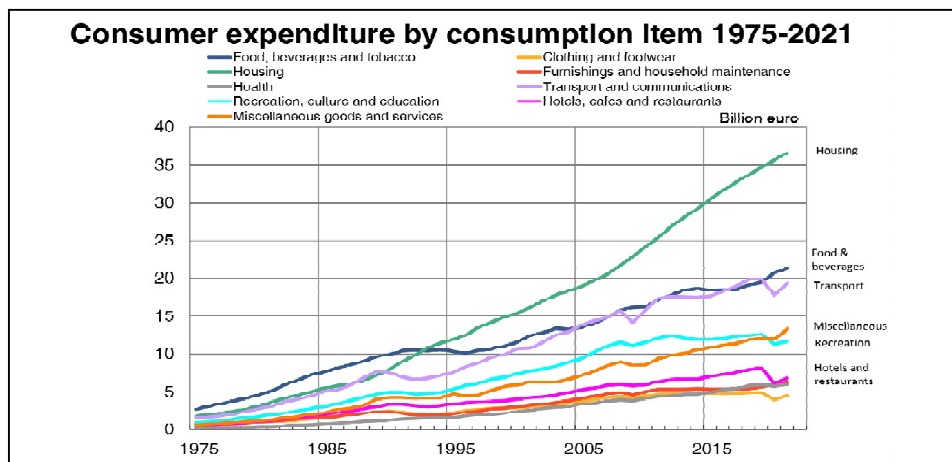
Statistics on private consumption in the national accounts are accurate. Statistics Finland, for example, tracks the prices of about 50,000 commodities in order to monitor consumer price inflation in Finland. It uses over 1,000 main consumer product groups. The measurement of consumption in Finland and the other Nordic countries is also statistically probably more accurate than in many other countries as it is done by commodity group. In addition, wholesale and distribution chains are concentrated, and good statistical data on retail sales is available due to Finland's broad application of automation in accounting and taxation. Finland also has fewer small specialty stores than in most euro area countries, and the turnover of such Finnish stores is typically smaller.

The grey economy can be approached through Statistics Finland's 12 main commodity groups. The performance of the grey economy has initially been estimated in the calculations using a more precise breakdown of consumer goods, from which the weighted sub-items have finally been summed into these 12 groups of goods. The share of cash payments varies somewhat in different categories of consumer goods. However, for most consumer items, electronic payment is the main payment method. For example, recurring items of expenditure such as rents, electricity, and water bills are paid electronically. In Finland, rent must generally be paid through a bank or payment service provider, and if this requirement is waived under freedom of contract in Finland, the landlord must issue a receipt for the rent.

The informal economy also plays a minor role in the housing market. Over the past 20 since the end of rent regulation, rents have risen most in terms of consumption expenditure, while housing and income support have increased. More than half of tenants receive some sort of housing allowance. However, rents are decided by landlords, who in turn know the limits of housing benefit and try to adjust rent levels to account for the housing benefit.

For these reasons, there is little incentive to pay grey rents, and rents are not paid in cash. The rent payment and the payment of company fees are most often made as e-invoices in online banking. Housing expenditure as a share of household consumption expenditure approached 29 % in 2017, while the next largest expenditure item was food and beverages, accounting for 16 % of consumption expenditure (Figure 8). The grey economy for housing expenditure includes renovation of dwellings, which is either not reported because it is a minor expense for the taxpayer or clearly exceeds the household deduction. There are also renovations in which the renovator works on condition that no tax information is filed. Some of the factors may still be covered by labor administration subsidies.

The most tempting consumption items to the grey economy are services not reported for tax purposes such as interior decoration and housekeeping, which may involve small scale cleaning or babysitting. The household deduction has also reduced the number of these items. In food consumption, tax evasion mainly focuses on bringing in cheaper alcohol to Finland from the Baltic countries across the Gulf of Finland. Here, however, the issue is considered in terms of end use and an attempt is made to estimate the value of grey consumption.



Source: Statistics Finland.

Figure 8: Household's private consumption in Finland, 1975–2021

Most grey economy activity in the transport sector involves freight transport, where its share is estimated to amount to 3–5 % of the value of road transport. The grey economy in road transport is the use of undeclared labor and transportation, as well as the use of bankruptcy and shadow companies. It occurs especially in soil transport for e.g. construction projects and international transportation (Lith, 2013). Concentration in transport operations has also been significant during the euro period, and large players dominate the turnover in the sector. According to Table 3, in the transport sector, large companies account for more than half of the turnover of the whole sector and, according to the concentration index, the sector is highly concentrated.

In catering and accommodation services, the grey economy typically involves the passing of alcohol or the passing of services through cash payments. In hotels, billing has shifted mainly to card payments in recent decades, which has greatly reduced cash-based by-passes. Persons making reservations are requested or obliged to prepay by card at the time of booking or upon arrival to assure the reservation. In restaurants, doorman, valet and concierge services have also recently shifted mainly to card payments, which could be quicker and cheaper. In such traditional cash services, the chaining of companies reduces the opportunities for systematic operation of the grey economy.

There may be a small amount of cash-out by passing in miscellaneous services, such as hairdressing, but card payments have begun to dominate as a form of payment, clearly reducing grey economic activity in these businesses. In entertainment services, the grey economy is largely limited to smaller-scale events. Ticket sales and security services for large entertainment events are often handled by an external operator who charges the event organizer.

The grey economy with the help of cash income has also decreased in Finland as companies have switched to electronic cash register systems and invoicing. In the corporate field, the grey economy has mutated to accommodate the far-reaching division of labor of large organization and decreasing number of small owner-entrepreneur operations. CEOs today are usually salaried professional executives responsible to their boards, shareholders and employees. Most are unwilling to take on any kind of grey economy risk. Businesses also rightly fear scrutiny from tax authorities. For years now in Finland about half of all corporate bankruptcy applications have been submitted by the tax authorities.

Table 5 presents an estimate of the euro-denominated size of the grey economy through consumption in 2017. The table also presents an estimate of the use of cash by consumer goods group and estimates of the use of cash in the grey economy. There is no direct statistical information on the use of cash in different commodity groups, but trade groups, various payment method surveys (e.g. NETS, 2018; Bank of Finland consumer surveys; the ECB survey of Esselink and Hernandez, 2017) give a fairly good idea of the distribution of cash payments by different commodity groups.

The use of cash in private consumption in Table 5 totals €12.5 billion, which corresponds quite well to the estimated cash payments of Finns in Finland. In 2017, the distribution of cash from various distribution channels in Finland was approximately €14 billion. In this comparison, it must be remembered that the bulk of euro cash distributed from ATMs and bank branches is most used by Finns abroad rather than by foreigners in Finland. Based on this, we estimate that approximately €12.5 billion was the value of domestic cash sales through private consumption in 2017 (Table 5).

The size of the grey economy has been estimated by consumption expenditure with the help of using Hirvonen et al. (2010) and Lith's separate studies and various other background calculations on the share of the grey economy in different industries, after which the share of cash payments in these consumption groups has been estimated, after which the use of cash grey economy by different consumption groups has been calculated. This calculation model was designed to ensure the production side of the calculations on the size of the shadow economy and the use of cash in the informal economy.

Calculating through consumption, the size of the grey economy is about €3 billion, which corresponds quite well to the grey economy calculated through the corporate sector, even if the estimates have been made with a different conceptual and substantive approach (Table 5). The grey economy implemented with cash is larger on the consumption side than on the production side of companies as cash is precisely the means of payment and

Table 4: Grey economy and illegal activity total income and cash use by industrial sector in Finland in 2017, EUR million

Grey economy calculated from production	Grey and criminal economy profits and tax evasion together			Cash use in grey and criminal economy together						
	Number of companies	Wage sum, EUR million	Grey economy undeclared wages, EUR million	Grey economy corporate income and dividends, EUR million	Grey economy profits from evaded VAT-taxes, EUR million	GREY ECONOMY TOTAL CORPORATE INCOME, EUR million	Hidden wages by industrial sector paid in cash, EUR million	Corporate grey income paid in cash, EUR million	Share of cash income in VAT tax evasion, EUR million	GREY ECONOMY INCOME PAID IN CASH TOGETHER, EUR million
GREY ECONOMY (together)	364,209	64,195	1,532	337	1,468	3,337	1225	26.7	170.9	320.1
Agriculture, forestry, and fishing	77 578	688	21.5	7.2	15.1	43.7	5.6	0.9	0.8	7.2
Mining and quarrying	946	265	9.7	9.9	1.0	20.6	0.5	0.5	0.4	1.4
Manufacturing	20 176	13 699	142.0	60.1	173.9	375.9	5.7	1.2	32.3	39.1
Electricity, gas, steam and air conditioning	923	722	2.5	8.2	0.0	10.7	0.0	0.0	0.0	0.0
Water supply, sewerage, waste managem.	1 480	373	2.8	1.0	4.4	8.2	0.0	0.0	0.0	0.0
Construction	41 110	6 500	461.1	82.2	365.1	906.4	59.9	13.2	70.3	143.4
Wholesale and retail trade, motor repair	41 893	8 900	229.6	37.1	362.4	629.0	9.2	3.0	43.4	55.5
Transportation and storage	20 110	4 526	36.7	16.8	108.5	169.0	5.9	1.0	13.9	20.8
Accommodation and food service acts	12 058	1 573	36.5	7.4	164.3	207.9	1.8	1.0	8.1	11.0
Information and communication	10 548	4 852	44.4	59.1	22.1	125.7	0.4	1.2	0.9	2.6
Financial and insurance activities	7 966	2 500	70.5	0.0	0.0	70.5	0.0	0.0	0.0	0.0
Real estate activities	29 260	790	52.7	25.2	2.3	80.2	7.4	3.0	0.5	10.9
Professional, scientific, and technical	36 654	4 741	151.8	0.0	78.1	230.4	0.0	0.0	0.0	0.0
Administrative and support services	14 228	4 004	150.1	0.0	80.4	236.1	0.0	0.0	0.0	0.0
Public administration and defence;	6 087	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Education	3 626	279	1.1	0.2	9.9	11.2	0.0	0.0	0.0	0.0
Human health and social work activities	18 386	2 525	38.9	0.0	6.0	44.9	0.4	0.0	0.0	0.4
Arts, entertainment and recreation	7 583	518	80.3	19.1	71.1	170.9	25.7	1.7	0.3	27.8
Other service activities	19 507	453	3.8	3.8	3.4	7.2	0.0	0.0	0.03	0.1
ILLEGAL ACTIVITY (Drugs, prostitution, smuggling, etc.)			310.0	310.0	15.1	635.0	300	230.0	15	545
TOGETHER (GREY AND ILLEGAL ECONOMY)			1842.3	647.1	14830	3572.4	4225	256.7	185.9	865.1
Gross domestic product (GDP) at market prices, EUR million						223 849				
Grey economy share from private sector wage sum (2017), %						5.2 %				
Grey and criminal economy share of GDP at market prices (2017), %						1.77 %				
Grey and criminal economy share of cash usage from GDP at market prices (2017), %						0.89 %				

Gross domestic product (GDP) at market prices, EUR million
 Grey economy share from private sector wage sum (2017), %

Grey and criminal economy share of GDP at market prices (2017), %

Grey and criminal economy share of cash usage from GDP at market prices (2017), %

This table combines Hirvonen, Liht, and Walden's (2010) calculations of industry share estimates for the grey economy based on the Finnish Tax Administration's tax audits of 2008. Industry calculations have been made for different forms of income in the grey economy: 1) Dark wages; 2) Grey business income (hidden income items) and hidden dividends; and 3) avoided and unpaid VAT taxes, calculated here using the above-mentioned shares from Statistics Finland's and the Finnish Tax Administration's statistics for 2017. Estimates of consumption surveys have been based on estimates from consumer surveys (BoF consumer surveys, ECB Such survey and Nais 2016). It has been assumed for criminal activity that half is wages and half is profit.

Table 5. Use of cash in grey and illegal economy by private consumption item in Finland 2017

Grey economy by private consumption	Expenditure		Share, %		Grey economy size estimates		Share of cash in grey economy consumption			Total value of grey economy cash sales, EUR million
	Consumption item	2017	2017	2017	Grey economy value, EUR million	Grey economy GDP-share, % (GDP 2017: 223 843 M€)	Cash sales from consumption value, % Assumption:	Cash sales value, EUR million	Cash sales maximum share in grey economy Assumption:	
Household consumption expenditure		115717			2955.5			12480.3		1488.5
Food, beverages, and tobacco	C01+CC2	18410	15.9	1.93	355.3	0.16	26.7	4912.3	0.05	245.6
Clothing and footwear	C03	4805	4.2	4.89	235.0	0.10	12.5	600.6	0.10	60.1
Housing	C04	33227	28.7	0.82	272.5	0.12	2.0	664.5	0.20	132.9
Furnishings and household maintenance	C05	5461	4.7	9.51	510.1	0.23	0.0	163.0	0.10	16.4
Health	C06	5419	4.7	1.00	54.2	0.02	5.3	289.3	0.06	17.4
Transport and communications	C07+CC8	16449	14.2	3.00	493.5	0.22	14.9	2457.7	0.14	344.1
Recreation, culture, and education	C09+CC10	12604	10.9	4.20	529.4	0.24	16.5	2086.0	0.25	521.5
Education	C10	460	0.4	0.06	0.3	0.00	5.0	23.0	0.10	2.3
Hotels, cafes, and restaurants	C11	7642	6.6	4.80	366.8	0.16	14.2	1036.4	0.10	108.6
Miscellaneous goods and services	C12	11240	9.7	1.15	129.5	0.06	1.7	196.0	0.10	19.6
Illegal economy trade (drugs, pimping, smuggling, doping etc.)					690					550
Drugs					200					180
Smuggling (alcohol, tobacco, snuff)					70					50
Illegal medicine trade					50					40
Doping					80					50
Pimping and prostitution					260					200
Selling stolen goods (metals, durables, working machines, etc.)					30					30
TOGETHER		115 717	100.0	2.55	3545.462	1.63	10.79	12480.31	0.13	2018.47
Sources:	National accounts	National accounts	National accounts	Calculations and sectoral estimates	Calculations	Weighted average	Nets (2018) retail stores and questionnaires	Corresponds quite closely cash usage in Finland	Weighted average	Calculation
Grey economy share of consumption expenditure, %			2.55							
Grey and criminal economy share of consumption expenditure, %			3.15							
Grey and criminal economy share of GDP, %			1.63							
Grey and criminal economy cash sales of GDP, %			0.90							

Calculations:

The consumption expenditure estimates obtained from consumption surveys and surveys (Bank of Finland, ECB, and NETS) can be applied to the consumption expenditure groups of Statistics Finland's private consumption by commodity group. The expenditure share calculations for the various consumer goods are more detailed than the estimates for the use of cash, but are aggregated here for the main consumption items. In the share estimates of the grey economy by consumption group, the estimates of Hivonen et al. (2010) have been used insofar as they have been available. Other occasional publications on estimates of the grey economy for different consumption groups (VAT evasion and freight transport) have also been used.

savings used by consumers. However, it is still worth remembering that the calculations are rather only rough estimates of the phenomena of the grey economy and should be considered as indicative calculations.

Our intention here has been to produce an overall picture of the size of the grey economy based on a sector-by-sector analysis and a comparison of production and consumption items. Thus, there may not be a need for more precise figures when configuring policies to combat grey economic activity. The aim has been to estimate the potential maximum size of the grey economy and cash use of cash in the grey economy. The results are useful in targeting specific grey economic activity.

7. Summary of the Grey Economy in Finland

This study sought to estimate the size of the grey economy in Finland and the use of cash in the grey economy. Our assessment of the grey economy combines the estimates of Hirvonen, Lith, and Walden (2010) on the extent of Finland's grey economy based on tax audits with Finland's National Accounts and the Finnish Tax Administration's background data on income flows and taxes in 2017. The grey economy's contributions are mainly based on 2008 tax audits.

While corporate tax audits are likely the most reliable available means for determining the functioning of the grey economy, the tax audits do not randomly target companies but focus instead on companies suspected to have financial issues and possible grey economy involvement. Thus, such calculations should be considered as maximum estimates of the grey economy. Our estimates likely overestimate Finland's grey economy, especially with respect to the use of cash. There is little direct research data on the amount of the grey economy through electronic payments. Assessing the grey and criminal economy is fundamentally more challenging than evaluating other economic activities as the participants strive to conceal their activities. Companies suspected of tax evasion are likely the focus of grey economy audits, so the share of the grey economy by industry is likely overestimated. As this bias would also have been present in more recent tax audits, it is unnecessary to re-sample.

Finland's key areas of the grey economic activity are under-the-table wage payments (dark wages) and overridden sales to evade VAT (typically involves sales on commission). Finland's grey economy is concentrated in a few problematic industries, notably construction, accommodation, catering, and freight transport as they are more vulnerable to tax evasion than other industries. There are also temptations to evade VAT in small-scale trade (market trade, buying and selling shops, and smaller shops in the trade or services sector). For the largest retail groups or chained wholesale and retail groups, this temptation is small due to the huge scale of standardized operations, reputational risk, and the coverage of electronic cash register systems. The halving of the use of cash during the euro era in retail payments has also clearly reduced the scope for VAT evasion or the payment of undeclared wages through cash payments. This study does not assess tax

evasion and money laundering related to international capital movements or investments as it is not directly related to the grey economy of domestic production or the use of cash in the grey economy.

Finland imposed numerous restrictions on corporate grey economy activities in the past decade, including the Salary to the Bank Act (2013) and the Obligation to Offer a Receipt (2014). The effectiveness of these measures has been investigated by the Finnish Tax Administration's Grey Economy Information Unit in a number of separate reports that find decreased grey economy activity and increased tax revenues. As the targeted measures affect sectors particularly vulnerable to the grey economy, they have also reduced the grey economy as a whole and its opportunities for operation in Finland. Thus, the industry shares used a decade ago likely overestimated the size of the grey economy, so the estimates obtained in this study should be considered as maximum estimates of the grey economy.

This study has also sought to examine – apparently for the first time – how cash is actually used in the grey economy. As elsewhere in the euro area, cash is the only legal tender in Finland. However, the use of cash in payments is clearly declining and card payments dominate retail payments.

With regard to the method of payment, we note that there is freedom of contract in Finland. The payment alternatives to cash have evolved according to market conditions. The general decrease in the use of cash in payment reduces the share of cash in the VAT cycle, and as a result opportunities for unrecorded by-sales. By the same token, the decrease in the use and availability of cash has a direct effect on the amount of undeclared cash wages. The use of cash in euro payments has halved in the euro period. More than 80 % of grocery purchases are now made with card payments. The grocery trade, like most retail trade, is highly concentrated and chained in Finland. Thus, grey economy opportunities and the cash needed to exploit such opportunities are scarce in Finland. The halving of the use of cash has reduced the opportunities for the grey economy as well VAT evasion in trade.

Based on the calculated figures, international estimates that put the size of Finland's grey economy at well over 10 % of GDP are clearly unrealistic. The Hirvonen et al.(2010) report to the Finnish parliament, which was based on turnover and the number of companies in 2010, came up with a grey economy size equivalent to just under 7 % of GDP. Based on calculations in this study this seem also an over estimation. This study, using both production-side and consumption-side calculations, found a grey economy size corresponding to about 1–2 % of GDP. Even if we assume that these two ways to calculate grey economy from the supply and demand side could not be entirely separate, we never reach a figure for grey economy greater than 3 % of GDP.

This study assessed the role and use of cash as a tool in the grey economy. Although the decline of cash usage is quite familiar from retail payment statistics and various consumer surveys, it remains challenging to ascertain the use of cash in the grey economy,

particularly in VAT evasion. Based on our estimates, the use of cash in the grey economy seems to be well below €1.5 billion. Given that the estimated use of cash in Finland in 2017 was approximately €14 billion, it would be less than 10 % of cash usage. As an overall conclusion, the measures chosen by Finland to combat grey economic activity can be deemed effective.

Notes

1. A Finnish version of this study has been published in the Bank of Finland A-series in 2021 with an English summary: Takala, K. (2020): Käteisen käytöstä harmaassa taloudessa Suomessa, A:121, <https://helda.helsinki.fi/bof/handle/123456789/17691>
2. See eg. Schneider F. (2015). http://www.bblf.bg/uploads/files/file_378.pdf
3. ECB(2020): <https://www.ecb.europa.eu/pub/pdf/other/ecb.spacereport202012~bb2038bbb6.en.pdf>
4. Foley, S., Karlsen, J. and Putniņš, T. (2018)
5. Feige (2015).
6. *THE LEGATUM PROSPERITY INDEX™ 2020*, <https://www.prosperity.com/globe#FIN>
7. <http://reports.weforum.org/global-competitiveness-report-2018/competitiveness-rankings/#series=EOSQ144>
8. *World Economic Forum, The Global Competitiveness Report 2018: Organized crime You are moving to another service.* <http://reports.weforum.org/global-competitiveness-report-2018/competitiveness-rankings/#series=EOSQ035>
9. In Finland least corruption The Global Competitiveness Report 2018 - Reports - World Economic Forum (weforum.org) and largest judicial independence The Global Competitiveness Report 2018 - Reports - World Economic Forum (weforum.org)
10. OECD (2019a): *Government at a Glance 2019*, OECD Publishing, Paris, <https://www.oecd.org/gov/gov-at-a-glance-2021-finland.pdf>
11. These background calculation tables are presented in the Finnish version of the study in Appendix 1, <https://helda.helsinki.fi/bof/handle/123456789/17691>

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