Reducing the Shadow Economy through Electronic Payments

CZECH REPUBLIC
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1 The shadow economy and its types</td>
<td>2</td>
</tr>
<tr>
<td>2 Shadow economy in the Czech Republic</td>
<td>6</td>
</tr>
<tr>
<td>3 Limiting the passive shadow economy in the Czech Republic</td>
<td>12</td>
</tr>
<tr>
<td>3.1 Obligation to make an electronic payment of wages and salaries</td>
<td>15</td>
</tr>
<tr>
<td>3.2 Obligation to make an electronic payment of pensions</td>
<td>18</td>
</tr>
<tr>
<td>3.3 Threshold for cash payments</td>
<td>21</td>
</tr>
<tr>
<td>3.4 Obligation to possess cash registers</td>
<td>24</td>
</tr>
<tr>
<td>3.5 Obligation to operate POS terminals</td>
<td>27</td>
</tr>
<tr>
<td>3.6 Tax incentives for consumers</td>
<td>31</td>
</tr>
<tr>
<td>3.7 Tax incentives for merchants</td>
<td>35</td>
</tr>
<tr>
<td>3.8 Receipt lotteries</td>
<td>39</td>
</tr>
<tr>
<td>Conclusions</td>
<td>42</td>
</tr>
</tbody>
</table>
This document is a part of the broader study that consists of (1) the report: “Reducing the shadow economy through electronic payments” (hereinafter referred to as the “Report”), as well as (2) technical appendices and (3) individual country reports.¹ The Report analyses the shadow economy in the eight Central and Southern European countries and investigates the potential of different regulatory measures to reduce the size of the non-observed economy. The current document provides more insight into the specifics of the Czech economy, including a more detailed description of the considered regulations and their economic impact in this country.

Our approach to the measurement of the shadow economy and its breakdown, as well as to estimating the effects of various regulatory measures is discussed in greater detail in the Report and the technical appendices.

This study was commissioned by MasterCard and was conducted independently by EY.

¹ The Report, technical appendices and individual country reports are available on: http://www.ey.com/pl/electronic-payments.
The shadow economy and its types
The scope and coverage of the shadow economy analysis in this report is largely consistent with the definition of the European Commission (see Chapter 1.1 of the Report). It is illustrated by Chart 1.1, showing that the shadow economy is approximated by unreported transactions, made by both registered and unregistered entities. A very important common factor for all types of shadow economy is that it is cash payments that allow the seller not to report the transaction. With only a few exceptions (such as e-commerce, online bookmakers or bartering), if an electronic payment was made instead of cash, it would hardly be possible not to register the transaction. Consequently, in our approach we focus on measuring unreported consumer cash transactions that should approximate the size of the shadow economy.

Chart 1.1. Different elements of the shadow economy

Economic activities

Unregistered entities

Registered entities

Illegal product or service

Legal product or service

Unregistered transactions

Tax evasion/ tax frauds

Other registered transactions

Illegal possession

Illegal sales

With benefits for one side of the transaction

With benefits for two sides of the transaction

Illegal form of sales

Illegal source

Other unregistered sales (informal activities)

VAT frauds (e.g. missing trader frauds)

Other tax evasion/ fraud schemes

Legend:

Unreported transactions that increase the tax gap
Unreported transactions that do not increase the tax gap
Reported transactions that increase the tax gap
Transactions that we measure in this Report

Notes: Unreported transactions are equivalent to the non-observed economy, as defined by the European Commission. Despite the fact that reported transactions that increase the tax gap (such as VAT frauds) are often the result of criminal activity, they are not part of the shadow economy, according to the definition by the European Commission and the definition used in this study. For more details see the text.

Source: EY

While approximating the size of the shadow economy by estimating the value of unreported cash transactions, we distinguish two categories of the shadow economy, each requiring different measures. The first component is the part of the shadow economy that can be reduced by promoting electronic payments and limiting the use of cash. Since cash payments leave no electronic trace, it is relatively easy to avoid reporting them. Cash payments can therefore generate the shadow economy activity, as they provide an incentive not to report the transaction and evade paying tax. The second category is the remaining part of the shadow economy, where it is not cash payments that influence the decision not to report the transaction, but the motivation of both sides of the transaction to benefit from evading tax liabilities or to sell/buy illegal products/services. The cash form of payment
is (usually) still required to hide the transaction, but it is no longer the source of illegal activity.

The key differentiating factor between these two components is the causal relationship between cash payments and the shadow economy. In the first category, cash payments contribute to the expansion of the shadow economy, while in the second component, increased cash payments are simply a result of the shadow economy activities. We therefore distinguish situations where:

- cash is a cause (or one of the causes) of the shadow economy;
- cash is a consequence of the shadow economy.

The shadow economy where cash is a cause is labelled as the "passive shadow economy", because one side of the transaction - the consumer, is “passive” in the sense that he/she does not benefit from not reporting the transaction, and may not even be aware that he or she is contributing to the expansion of the shadow economy through the cash payment. The shadow economy where cash is a consequence is defined as the "committed shadow economy" (see Chart 1.2), because both sides of the transaction are “committed” to using cash payments in order not to report a transaction and thereby benefit from a lower price stemming from evaded tax payments (for a more detailed description and further examples of the committed and passive shadow economy transactions see Table 1.1 in the Report).

Chart 1.2. Types of the shadow economy with respect to the role of cash

As this shows, the shadow economy is not homogenous - there are different shades of grey. Therefore, the consequences and measures to limit the shadow economy may also differ depending on its type.

Actions aimed at limiting the committed shadow economy should result in a lower demand for cash, and thus lead to the increased use of electronic payments. Nevertheless, measures to reduce the committed shadow economy are not related to promoting cashless payments, and would rather include, for example: increasing labour inspections at building sites, introducing more restrictive penalty sanctions for counterfeiting of excise products, etc.

In contrast to the committed component, the passive shadow economy is caused by cash payments. Therefore, it could be reduced either through actions promoting electronic payments or through measures increasing the share of cash transactions being registered.

In this study, we concentrate on solutions related to the development of non-cash payments (e.g. through the increased use of payment cards) as a means of reducing the passive shadow economy.
Shadow economy in the Czech Republic
In this section, we present estimates of the shadow economy in the Czech Republic. The estimates comprise the overall level of the shadow economy, its split into the passive and committed components, their evolution over time and the sectorial breakdown of the passive shadow economy. Our approach, which exploits the strengths and addresses the weaknesses of various methods of estimating the shadow economy, is discussed in greater detail in Chapter 3 of the Report, as well as Appendix 1 and Appendix 2.

The obtained results show that from 2004 to 2008, the Czech Republic saw a continuous fall in the overall level of the shadow economy – from 13.8% to 11.0% of GDP (see Chart 2.1). This trend came to an end at the outburst of the global financial crisis that took its toll also on the Czech economy. After a slight, but noticeable increase in the size of the shadow economy in 2009-2010, in the years that followed its level stabilised. In 2014, the non-observed shadow economy in the Czech Republic was estimated at 11.3% of GDP.

It has to be emphasised that the estimates presented in this document should not be compared with the often quoted results of another study where the shadow economy in the Czech Republic was estimated to exceed 15% of GDP in 2012-2013. The reason is that there are methodological differences between EY’s approach and the approach adopted by the authors of the quoted and some other studies.

Splitting the shadow economy into its passive and committed components, as well as sectorial breakdown of the latter, provide a more detailed insight into the Czech non-observed economy. To the best of our knowledge, no such analysis has been done in other research, and thus constitutes a contribution of this study to the literature. As discussed, the passive component is that part of the shadow economy that can be reduced by promoting electronic payments, and so limiting the use of cash that otherwise facilitates unregistered transactions. The committed shadow economy is the remaining part of the non-observed economy and should be dealt with using other tools.

The passive shadow economy accounts for the vast majority of the overall non-observed economy in the Czech Republic (see Chart 2.1). In the 2009-2014 period, for which the decomposition of the Czech shadow economy into the committed and passive components was possible, the passive shadow economy was relatively stable and exceeded 10% of GDP. The committed component, in turn, recorded a slight increase, though its level (1.1% of GDP in 2014) remained significantly below that of the passive shadow economy.

Chart 2.1. Shadow economy in the Czech Republic (% of GDP)

![Chart 2.1. Shadow economy in the Czech Republic (% of GDP)](chart.png)

Notes: Decomposition of the overall shadow economy for the years 2004-2008 was not possible due to insufficient data. Shadow economy figures for 2014 are based on estimates/forecasts of some of the shadow economy determinants.

Source: EY

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3 Appendix 1 and Appendix 2 include the discussion of methodological issues that have been identified in other studies and the way they have been addressed in EY’s approach.
Sectorial breakdown of the passive shadow economy

Additional insight into the passive shadow economy is provided by the sectorial breakdown of this component, based on the approach described in the Report and Appendix 1.

Chart 2.2. Sectorial breakdown of the passive shadow economy in the Czech Republic (% of total passive shadow economy, long-term averages)

Source: EY
Most of the available estimates of the sectorial structure of the shadow economy in the literature are based on the sectorial breakdown of unregistered employment. The high share of unregistered employment is often found in the construction sector, hotels and restaurants, as well as in the transport services (see Chapter 2.3 of the Report). While we tend to agree with the view that in many countries it is the construction sector where the share of unregistered employment is particularly high, this category of the shadow economy should be dealt with using tools other than, for example, the promotion of electronic payments. In fact, the sectorial breakdown of unregistered employment provides little, if any, information on the sectors where retail sales are often not reported, and which should therefore be targeted with measures aimed at increasing the share of registered consumer transactions. By contrast, in our study we focus on the sectorial breakdown of the passive shadow economy activities in retail sales, where consumer cash payments are the source of unreported transactions. This seems to be the first such an attempt in the literature, which is described in greater detail in Appendix 1.

In our approach, the larger the sector and the more saturated with cash payments, the higher the share in the total passive shadow economy it has.\(^4\) It turns out that the most important role in the passive shadow economy is played by the sector supplying food, beverages and tobacco (see Chart 2.2), which accounts for 39.6% of the total passive shadow economy in the Czech Republic. This is mainly the result of its large share in the total consumption expenditure of the Czech households. The sector that ranks second, in terms of its contribution to the size of the passive shadow economy, is restaurants, bars and cafes, followed by cars and motorcycles with related services and repairs.

### Passive shadow economy and lost government revenues

The passive shadow economy may entail serious consequences, many of which have been discussed in Chapter 1 of the Report. Here, we present estimates of additional government revenues that would be collected if all the passive shadow economy cash transactions were reported. This allows us to illustrate the potential budgetary benefits from addressing this issue in the Czech Republic.

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4 For more details on our methodology see Appendix 1.
Details of how we calculated the VAT and CIT revenue shortage due to the passive shadow economy activities are presented in Appendix 6. Here we simply indicate that we do not apply the standard VAT or CIT rates in our calculations, since it would lead to overestimation of the budgetary effect. In our approach, we take into account how VAT rates differ among sectors in various countries, and what the effective CIT rate is relative to gross operating surpluses recorded by companies. This is consistent with our preference to be on the conservative side rather than presenting biased, overestimated figures that could weaken the credibility of our conclusions.

The obtained results show that the game is worth the candle, since potential government revenues from eliminating the passive shadow economy in the Czech Republic amount to 2.6% of GDP or CZK 109.3 bn (Chart 2.3). Consequently, even a partial success in dealing with this category of unregistered transactions can significantly improve the public finance situation. This, therefore, leads us to a question about the measures that could be adopted in the Czech Republic in order to address the passive component of the shadow economy.
Limiting the passive shadow economy in the Czech Republic
The high level of the shadow economy has significant economic and social implications. Its adverse consequences include: a reduced tax base, a lower quantity/quality of public goods, distortions in market competition, the degradation of economic and social institutions, and – through these channels – lower economic growth. While the shadow economy may also have some advantages, it is evident that they are significantly outweighed by a wide range of negative consequences of unreported activities. Therefore, having estimated the size and structure of the shadow economy in the Czech Republic, in this section we focus on the measures that could reduce the non-observed economy in this country.

The analysis conducted in the Report shows that an increase in the card payments to GDP ratio does reduce the passive shadow economy. Other factors contributing to the contraction of the shadow economy include: an increase in GDP per capita (in PPS), a decline in the ratio of taxes to GDP and institutional and tax morale, approximated by the World Bank’s rule of law index (for more details see Chapter 3.1 of the Report and Appendix 1).

For policymakers, it may be easier to influence some of the identified determinants of the shadow economy, while it may be difficult to affect others. For example, changes in the rule of law index seem very relevant for the overall and passive shadow economy levels. However, a significant improvement in this area may require introducing many, often difficult, reforms by a government, which may additionally take a long time. It is also not easy to significantly reduce the burden of tax and social security contributions, not least in light of the fiscal challenges faced by many countries in the aftermath of the economic crisis. On the other hand, public policies leading to an increase in the popularity of non-cash payments (especially card payments, which have been proven in the model to have a significant impact on the contraction of the shadow economy), seem relatively easier to implement.

Consequently, we conduct an impact assessment of various regulatory tools for the Czech Republic that (1) promote electronic payments and thereby reduce the value of cash payments, or (2) increase the share of reported consumer cash transactions, and through these channels decrease the size of the passive shadow economy (Chart 3.1). In our assessment, we show the quantitative impact of the considered regulations on the contraction of the passive shadow economy, and on the resulting growth in government revenues. We discuss the effect on public finance in net terms, since we also account for some potential costs that a given regulation may entail for the government (for methodological details, see Appendix 5 and Appendix 6).

Some of the presented solutions are based on obligation mechanisms, whereas others focus on providing incentives either to consumers or merchants. Some instruments promote the development of electronic payment infrastructure, while others promote changes in payment habits. Indeed, Charts 3.2–3.3 show that the number of cards and terminals is relatively low in the Czech Republic. On the other hand, the utilisation of the existing infrastructure is somewhat higher, as illustrated by the value of card payments (% of GDP) in the Czech Republic (see Chart 3.4). This value, however, is still significantly below the European average. Therefore, while there seems to be a lot of room for improvement in the Czech electronic payment infrastructure, changes in consumers’ payment habits and/or merchants’ willingness to accept electronic payments are also desirable.

Finally, we need to emphasise that the analysed regulations may differ in terms of their scope and other parameters that may play a critical role for the ultimate impact of the considered instrument. Therefore, our analyses of the effects of the different regulations should be regarded as examples of the impact that various solutions may have on the shadow economy and public finance. Since these solutions may be modified in terms of their scope, timing and other parameters, their actual effect would change accordingly and would depend on the final decision of the regulators.

Chart 3.1. Considered mechanisms of the impact of regulations aimed at combatting the passive shadow economy

Source: EY
Chart 3.2. Number of cards per capita in the Czech Republic and selected European countries

Source: ECB, MasterCard, National Bank of Serbia, Central Bank of Bosnia and Herzegovina, Eurostat

Chart 3.3. Number of terminals per 1000 people in the Czech Republic and selected European countries

Source: ECB, MasterCard, National Bank of Serbia, Central Bank of Bosnia and Herzegovina, Eurostat
3.1 Obligation to make an electronic payment of wages and salaries

Mechanism of the regulation

This regulation introduces the obligation to make an electronic (non-cash) payment of wages and salaries. In its basic form, the regulation requires that this kind of payment be performed via a bank transfer, though it is possible to allow payment also in the form of prepaid cards.5

This regulation is already in force in many other countries, including Croatia, Slovenia or one region of Bosnia and Herzegovina (Republika Srpska). In those countries, employers are obliged to pay remuneration via bank transfers. Consequently, some employees have had to open bank accounts in order to receive their salaries.

In the Czech Republic, wages and salaries can be paid either in cash or via bank transfer. Payment in the form of bank transfer needs to be agreed upon between the employee and the employer. According to the World Bank data (Global Findex Database), in 2014 90.9% of the wage recipients in the Czech Republic received their wages into their accounts at financial institutions. However, in sectors affected by the shadow economy as well as in many SMEs, cash might still be the preferred form of paying the salary.

It is very likely that most of this money is later spent also in cash form, part of which may contribute to the passive shadow economy transactions. The introduction of the considered regulation, in turn, should shift all or most of the reported wages and salaries that were so far paid in cash to bank accounts (or prepaid cards).6 This should also refer to all sorts of bonuses and prizes granted to employees.

5 The employer can load prepaid payment cards with the net salary or wage and give them to employees who can use the card for their everyday payment transactions in the same way as a regular debit or credit card. We assume that the effects discussed here are similar for wage and salary payments whether paid by bank transfers or as prepaid cards.

6 We account for the fact that this regulation will not influence the form of compensation received by unregistered employees, who will continue to receive their remuneration in cash – for more details see Appendix 5.
The electronic payment of wages means that people who previously received their remuneration in cash would have to make additional effort, e.g. through making ATM withdrawals, if they would like to continue to use cash. Therefore, they should more often perform their transactions with payment cards and, consequently, make less cash payments. This, in turn, should contribute to the reduction of the passive shadow economy (see Chart 3.5).

If there are obstacles to introducing this regulation at an economy-wide level, the implementation of such a measure might first be considered in the selected sectors. In order to introduce this kind of regulation, amendments should be implemented to the Czech Labour Code.

**Impact of the regulation on the passive shadow economy and government revenues**

We estimate the impact of this regulation on the value of cash payments replaced with card payments in a few steps. First, we use the World Bank’s survey data (Global Findex Database) to calculate the number of people receiving their wages in cash in 2014. Second, we assume that all unregistered employees receive their remuneration in cash. Third, we conservatively assume that cash recipients are paid, on average, the minimum wage for their work. Finally, with the use of data on household savings rate and the payment behaviour of a typical card holder, we estimate the value of cash expenditure replaced with card payments in the situation when all registered employees receive their wages in electronic form. For more details on the applied approach and calculations see Appendix 5.

The results of the estimation indicate that the regulation should lead to the contraction of the passive shadow economy in the Czech Republic by 0.13% of GDP. This, in turn, should result in additional government revenues, estimated at 0.032% of GDP or CZK 1,383 m (Chart 3.6).
Potential costs of the regulation

The introduction of obligatory electronic payments for wages and salaries should not generate significant costs. The likely costs are associated with fees related to maintaining additional bank accounts (or to the use of prepaid cards). These costs, depending on the legislation, may be covered either by the employer, the employee or the government (or shared among them). However, considering the growing availability of banking services, the obligation to pay remuneration into a bank account should have a limited, if any, negative impact on employers and employees. Moreover, it is worth noting that in 2014 the European Parliament passed legislation\(^7\) aimed at increasing the availability of financial accounts for all types of consumers. It states that all Member States must introduce laws that oblige banks and other financial institutions to offer accounts with basic features\(^8\) free of charge or at a reasonable cost.

Estimated timing of the impact of the regulation

The majority of the estimated impact should take place almost immediately after the introduction of the regulation. The remainder should materialise within 1–2 years, when the behaviour of new card holders will converge to the behaviour of a typical card holder (e.g. in terms of the frequency of card payments and ATM withdrawals). However, some of the estimated effects may occur even before the introduction of the regulation (but after its announcement), since some entities will start acting in compliance with the regulation already in the transition period.

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\(^7\) Article 46 of DIRECTIVE 2014/92/EU of 23 July 2014 on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features.  

\(^8\) These features are not defined in the EU's legislation and should be determined at a national level.
3.2 Obligation to make an electronic payment of pensions

Mechanism of the regulation

This regulation obliges the government to provide pension benefits in the form of electronic payments, e.g. through bank transfers and/or prepaid cards. The mechanism of this measure is analogous to the obligation to make an electronic payment of wages and salaries (see above). The main difference is the targeted group and the fact that social security benefits payments are performed only by public institutions (not by private businesses), so, once the regulation has been introduced, there should be no violations of the law (which may sometimes take place in the case of legislation concerning wages and salaries).

All social security benefits (including pensions) are paid electronically, for example, in Denmark, while in Sweden they are paid electronically or on prepaid cards. A law on mandatory electronic payments of social security benefits has also recently been approved in Uruguay.

In the Czech Republic, social security benefits and social assistance, such as maternity, unemployment and sickness benefits, can be paid via bank transfer or postal order. However, not all of the Czech Republic state institutions accept cashless payments. The electronic payments are possible e.g. in the case of fines issued by the police, but in the case of post offices, an electronic payment is not possible, unless a person is a client of ČSOB bank or Era post saving bank.

In order to introduce this kind of regulation, amendments should be implemented to the:

- Act 117/1995 Coll. which Art. 58 lays down ways for payment of benefits;
- Decree of the Ministry of L&SA on preferred form of social security payment.

The electronic payment of pensions would mean that people who previously received their pension benefits in cash would have to make an additional effort, e.g. through ATM withdrawals, if they would like to continue to use cash. Therefore, they should perform their transactions with payment cards more often and, consequently, make fewer cash payments. This, in turn, should contribute to the reduction of the passive shadow economy (see Chart 3.7).

Chart 3.7. Mechanism of the regulation – Obligation to make an electronic payment of pension benefits

Impact of the regulation on the passive shadow economy and government revenues

The estimation of the impact of this regulation on the value of cash transactions replaced with electronic payments is similar to the approach applied to the obligation to make an electronic payment of wages and salaries. First, we obtain the data on the total net value of the pension benefits for the Czech Republic using Eurostat datasets. Second, we use the World Bank’s survey data (Global Findex Database) on the percentage of government transfers recipients in the Czech Republic who received these transfers in cash in 2014. We assume that this figure, equal to 30.0%, is also applicable to pensions’ recipients.

In the last step, we take into account the household saving rate and the payment behaviour of a typical card holder in the Czech Republic to estimate the value of cash payments replaced with card transactions due to the introduction of the considered regulation. For more details on the applied approach and calculations see Appendix 5.

The potential decrease in the passive shadow economy in the Czech Republic caused by the obligatory electronic payment of pensions has been estimated at 0.47% of GDP. The associated increase in government revenues has been estimated at 0.119% of GDP or CZK 5,058 m (Chart 3.8).
A further decrease in the passive shadow economy in the Czech Republic can be achieved by the obligation to make an electronic payment of other government transfers, such as unemployment benefits. However, an estimated potential decrease in the shadow economy caused by the extension of this regulation to unemployment benefits amounts to a mere 0.011% of GDP, which corresponds to additional CZK 113 m of government revenues (see Chart 3.9).
Potential costs of the regulation

The costs of this measure are analogous to those of an electronic payment of wages and salaries, and comprise mainly the costs of maintaining additional bank accounts (see above). However, as already mentioned, in EU countries the new directive enforces the introduction of basic accounts that must be offered by all financial institutions free of charge or at reasonable cost, as defined by the Member States.

It is also worth noting that traditional methods of paying pensions, such as delivery by post, can be relatively expensive. For example, according to the Polish Social Insurance Institution, the delivery cost of pensions by post is 10 times larger than in the case of electronic payments to bank accounts. Transferring pension benefits directly to a bank account instead of a delivery by post would therefore decrease the costs of paying pensions incurred by the government.

Estimated timing of the impact of the regulation

While the electronic payment of pensions may constitute a technological barrier for some elderly people, most of the estimated impact should take place soon after the introduction of the regulation. The remainder of the effect should materialise when the behaviour of new card holders will converge to the behaviour of a typical card holder (e.g. in terms of the frequency of card payments and ATM withdrawals), which – in the case of pensioners – may take longer than in the case of employees.

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3.3 Threshold for cash payments

Mechanism of the regulation

This regulation defines a certain monetary value (threshold) for a single transaction above which consumer cash payments are not allowed. Consequently, consumer cash transactions above the introduced threshold should disappear and be replaced with additional electronic payments, thus reducing the size of the passive shadow economy and increasing government revenues (Chart 3.10).

Chart 3.10. Mechanism of the regulation – Threshold for cash payments

Thresholds for cash payments are already present in some countries, including Bulgaria, Croatia, Slovakia and Slovenia (in some of them consumer payments above the threshold may be accepted, but generate a lot of administrative obligations for the merchant).

The Czech Republic introduced the limitation of cash payments in 2004 in Act 254/2004 Coll. Originally, the limit was established at 350,000 CZK. It was subsequently lowered by Act 261/2014 Coll. to the current level of 270,000 CZK, which has been binding since 1st December 2014. The Act 254/2004 Coll. in its par. 3/2 explicitly enumerates situations, when the rule does not apply (for example, payments of taxes, customs, premiums from commercial insurance, payments arising from employment relationship, payment of pensions etc.). The fine for violating the law (by a person who transfers or receives cash payment exceeding 270,000 CZK) amounts up to 5,000,000 CZK.

The regulation lowering thresholds for cash payments could be implemented in the same legal act as the currently binding obligation. Should the considered regulatory measure be difficult to implement for all the sectors in the economy, alternatively such thresholds might be established for cash payments in selected sectors/areas only, not least those accounting for a large share of the passive shadow economy in the Czech Republic.

Impact of the regulation on the passive shadow economy and government revenues

In order to estimate the effect of a given threshold for consumer cash payments in the Czech Republic, we need to know the distribution of consumer cash transactions in this country. Such data, however, is not available. Instead, we benefited from the research conducted by the Polish central bank on the distribution of consumer cash payments in Poland. The obtained data has been adjusted accordingly to estimate such a distribution for the Czech Republic (for more details see Appendix 5).

In the next step, we consider two scenarios: (1) a “conservative” scenario, with four different cash payment thresholds: CZK 1000, 1500, 2000, and 2500 and (2) a “non-conservative” scenario, with an additional threshold of CZK 2,709 (equivalent of EUR 100 at the time of conducting this study).

In the conservative scenario we account for the fact that, above a (relatively) high threshold of the transaction value, there should be almost no passive shadow economy because one can expect that consumers tend to demand receipts for more expensive, durable goods in order to obtain a warranty. Obviously, there are high-value cash payments in the committed shadow economy. However, these would remain unaffected by the considered regulation, as both parties benefiting from this kind of activity would continue to use cash in order to avoid reporting the transaction. Consequently, in this scenario we assume that there is no passive shadow economy among the top 7% of consumer cash transactions (in terms of their value), i.e. for transactions above CZK 2,653. In the non-conservative scenario, the above assumption no longer holds.

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10 This corresponds to the percentage of consumer cash transactions value being recorded above the highest threshold considered in the Polish central bank’s research that we draw on.
It should be emphasised that the thresholds considered are presented as nothing more than examples of different maximum levels of allowed consumer cash payments. We do agree that the presented limits, especially the lowest ones, may seem unacceptable and hardly possible to implement. Nevertheless, these thresholds have largely been determined by the availability of data from research conducted by the National Bank of Poland. Moreover, above the higher transaction levels, the value of consumer cash payments is marginal. For example, above EUR 100 (or CZK 2,709), it accounts for only 6.7% of all consumer cash transactions (in terms of their value). This share would further decline with an increase in the threshold level.

Therefore, the arguments outlined above strongly suggest that establishing high thresholds for consumer cash payments would have little, if any, impact on the passive shadow economy in the Czech Republic.

To estimate the effect of establishing different thresholds for consumer cash transactions on the value of cash and card payments, we apply a simulation approach (for more details see Appendix 5). The impact of the regulation on the change in size of the passive shadow economy and government revenues is presented in Chart 3.11 and Chart 3.12.

The lower the threshold level, the more cash transactions would be replaced with card payments, implying a stronger impact of the regulation on the passive shadow economy. The obtained results show that the contraction of the non-observed economy in response to a drop in the level of the threshold is more than proportionate, which reflects the distribution of consumer cash payments cumulating around the lower value transactions. The impact of the considered regulatory measure on government revenues corresponds to the estimated changes in the size of the passive shadow economy (see Chart 3.11 and Chart 3.12).

Chart 3.11. Thresholds for consumer cash payments - impact on the passive shadow economy in the Czech Republic (% of GDP)

<table>
<thead>
<tr>
<th>Threshold value in CZK</th>
<th>Conservative approach</th>
<th>Non-conservative approach</th>
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<td>2709</td>
<td>-0.7</td>
<td>-0.2</td>
</tr>
<tr>
<td>2500</td>
<td>-0.9</td>
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<tr>
<td>2000</td>
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<td>1500</td>
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</tr>
<tr>
<td>1000</td>
<td>-2.8</td>
<td>-2.2</td>
</tr>
<tr>
<td>-3.0</td>
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<td>-2.0</td>
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Source: EY
Chart 3.12. Thresholds for consumer cash payments – impact on government revenues in the Czech Republic (CZK m).

<table>
<thead>
<tr>
<th>Threshold value in CZK</th>
<th>Conservative approach</th>
<th>Non-conservative approach</th>
</tr>
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<tr>
<td>2500</td>
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<td>2000</td>
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</tr>
<tr>
<td>1500</td>
<td>19,047</td>
<td>23,644</td>
</tr>
<tr>
<td>1000</td>
<td>29,638</td>
<td>29,638</td>
</tr>
</tbody>
</table>

Source: EY

In addition, this regulation may encourage the purchase/lease of POS terminals and, through the increased acceptance of card payments, additionally stimulate growth in the value of card payments below the established threshold. This effect will be stronger, the lower the threshold for consumer cash payments. However, we do not account for that additional impact in our calculations, which makes our results – at least in this context – conservative.

On the other hand, we have assumed that the passive shadow economy is uniformly distributed in the considered range of unit transaction values, while it is likely that a relatively large share of the passive shadow economy is “concentrated” around lower-value transactions. Moreover, we do not account for the fact that some consumers might split their cash payments into several transactions, so that the value of each cash transaction is lower than the imposed threshold. Consequently, these factors, if accounted for, would reduce the estimated effect of the considered thresholds.

Potential costs of the regulation

The likely costs of this regulatory measure are linked to the use of additional bank accounts (or prepaid cards) that enable conducting transactions whose value exceeds a given threshold. However, in 2014 the EU obliged financial institutions to offer accounts with basic features free of charge or at a reasonable cost. Moreover, the regulation may force some merchants to purchase (or lease) POS terminals and incur respective costs.

Estimated timing of the impact of the regulation

The estimated impact of the regulation should materialise almost immediately after its introduction. In the longer run, the regulation may also stimulate growth in the value of card payments also below the threshold.
3.4 Obligation to possess cash registers

**Mechanism of the regulation**

This regulation obliges a wider group of businesses (depending on the type of business activity or the value of the yearly turnover) to use cash registers or related fiscal devices in order to record every individual transaction, regardless of the means of payment.

The process of introducing cash registers, often described as the process of fiscalisation, is intended to provide a mechanism for tax administrations to supervise the records in the cash turnover and monitor and detect non-compliance (see Chart 3.13).

It should be noted that several factors affect the efficiency of this regulation. First, the introduction of mandatory cash registers is usually accompanied with intensified fiscal controls and audits. Second, modern fiscalisation solutions, such as so-called online cash registers, which have become increasingly popular over the last few years, may provide better results. In this case, each fiscal device is equipped with internet connectivity and appropriate software that enables the delivery of individual transaction data on a real time basis to the tax administration. In this way, every invoice is authorised by the tax office before being presented to the buyer.

Poland, Italy and recently Sweden have already obliged a wider group of businesses (with certain exceptions depending on the type of business or limits of turnover) to record every individual money transfer via fiscal devices, regardless of the means of payment. Furthermore, in the case of Bosnia and Herzegovina, Croatia, Slovakia, Serbia and Hungary, cash registers must be equipped with internet connectivity so that data on each transaction can be delivered on a regular time basis (e.g. real time, daily) to the tax administration server. Additionally, a law on fiscalisation becomes effective in 2016 in Slovenia.

Currently, in the Czech Republic, the Ministry of Finance is aiming to implement a regulation concerning the introduction of the remote system that would transfer data on transactions performed by merchants to the Ministry of Finance/Tax Administration. The solution is inspired by the fiscalisation model adopted in Croatia. The basic idea is that each fiscal device (cash register) should be equipped with or supported by internet connectivity and an appropriate software tracking each payment.
Impact of the regulation on the passive shadow economy and government revenues

We estimate the impact of the obligation to operate cash registers on the passive shadow economy based on the panel econometric analysis, where we use the regulatory data from 17 European states. The obtained results suggest that a regulation obliging businesses to record every transaction using a cash register significantly increases the value of card payments per capita. Such findings confirm that the regulation-driven increased propensity of businesses to report transactions not only leads to an increased share of registered consumer cash payments, but also promotes electronic transactions through increased card acceptance. This implies crowding out consumer cash payments with card payments, which in turn translates into the reduction of the passive shadow economy. For the Czech Republic, which as of end-2015 had not yet introduced this measure, the potential drop in the passive shadow economy caused by the introduction of fiscalisation was estimated at 0.52% of GDP (see Chart 3.14). The associated increase in government revenues was estimated at CZK 5,671 m.

Chart 3.14. The impact of the obligatory possession of cash registers on the change in the size of the passive shadow economy in the Czech Republic (% of GDP)

Potential costs of the regulation

Purchasing cash registers may constitute a significant implementation cost of the regulation. Furthermore, during the implementation phase, intensified fiscal controls are necessary in order to monitor how businesses comply with the new law. In addition, in the case of online cash registers, the cost of dedicated equipment and software tracking and transferring each receipt to the tax authority should be taken into account. This infrastructure should be installed both by merchants and the tax authority.

In addition to the panel econometric analysis, we investigated the impact of the number of cash registers on the size of the passive shadow economy in Poland (see Appendix 5). The obtained estimates suggest that an increase in the ratio of the total number of cash registers to the total number of active enterprises by 0.1 leads, on average, to a decrease in the passive shadow economy by 0.326 percentage points of GDP.

Source: EY

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11 These countries include Poland, Croatia, Serbia, Slovenia, Slovakia, the Czech Republic, Bosnia and Herzegovina, Hungary, Denmark, Norway, Sweden, the United Kingdom, Austria, Finland, Germany, Portugal and Spain.

12 On the basis of the Polish Ministry of Finance data of cash registers.
Estimated timing of the impact of the regulation

The Czech Republic is currently working on the implementation of the fiscalisation. The process has been divided into distinct stages, with different types of tax payers included. The Czech regulators focus on restaurants in the first stage, while in the second stage the measure would be extended to retailers. At the time of conducting this study, the scope of the third stage was still under discussion. The whole process is expected to be completed by the end of 2016.
3.5 Obligation to operate POS terminals

Mechanism of the regulation

This regulation obliges certain types of businesses to operate POS (point of sale) terminals. POS terminals are devices that enable customers to settle their payments with payment cards. Since the development of the acceptance network is an important determinant of the popularity of electronic transactions, it is possible to stimulate the growth of card payments (replacing consumer cash payments) through the obligation to operate POS terminals in selected sectors. This would be most effective in the sectors accounting for a high share of the total passive shadow economy, and for business activities where the prevalence of POS terminals is currently relatively low. An increase in the popularity of card payments would lead to crowding out consumer cash transactions. This, in turn, would reduce the size of the passive shadow economy and increase government revenues (Chart 3.15).

Chart 3.15. Mechanism of the regulation – the obligation to operate POS terminals.

This type of regulation was implemented, for example, in South Korea, where in 2001 card acceptance was mandated for all VAT paying businesses. Moreover, in this country a financial penalty for card refusal was imposed in 2002. In the Czech Republic, there is no such regulation in place.

The analysed solution assumes that businesses are obliged not only to have a POS terminal, but also to use it in retail transactions, if requested by a customer. This regulation should be addressed to all sectors of the Czech economy. However, we considered situations where the regulation is binding either for a group of sectors or for individual branches that are responsible for contributing to the passive shadow economy in the Czech Republic.

The implementation of this measure should be accompanied by instruments that would enable, for example, the tax authorities to inspect the merchants’ compliance with this regulation. On the other hand, to the extent possible, the obligation to operate POS terminals should be accompanied by a reduction in other administrative burdens imposed on merchants, which may no longer be necessary. This applies, in particular, to the issuance of fiscal receipts, whose role – in terms of reporting transactions to tax authorities – may be fulfilled by the system integrated with the card acceptance network. This solution can support the fiscalisation process currently implemented in the Czech Republic.

The considered regulation may also be supported by incentives provided to merchants in the form of tax allowances, granted EU Funds or government (co)financing for the purchase of POS terminals (for example, in Poland the cost of purchasing cash registers can partially be deducted from the company’s VAT liability).
Impact of the regulation on the passive shadow economy and government revenues

We evaluate the impact of the considered regulation on the value of card and cash payments using a simulation approach.

Table 3.1. Number of terminals per 1000 inhabitants in the Czech Republic before and after introducing the regulation

<table>
<thead>
<tr>
<th></th>
<th>Current situation (1)</th>
<th>After regulation (2)</th>
<th>Existing gap (2)-(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreation and culture</td>
<td>0.075</td>
<td>0.627</td>
<td>0.552</td>
</tr>
<tr>
<td>Accommodation</td>
<td>0.061</td>
<td>2.403</td>
<td>2.342</td>
</tr>
<tr>
<td>Transport (private and public)</td>
<td>0.138</td>
<td>1.094</td>
<td>0.957</td>
</tr>
<tr>
<td>Fuels for vehicles</td>
<td>1.291</td>
<td>2.711</td>
<td>1.420</td>
</tr>
<tr>
<td>Restaurants, bars and cafes</td>
<td>0.437</td>
<td>7.792</td>
<td>7.354</td>
</tr>
<tr>
<td>Food, beverages and tobacco</td>
<td>4.909</td>
<td>16.555</td>
<td>11.646</td>
</tr>
<tr>
<td><strong>All passive shadow economy sectors</strong></td>
<td><strong>8.417</strong></td>
<td><strong>35.836</strong></td>
<td><strong>27.418</strong></td>
</tr>
</tbody>
</table>

Source: EY

In the next step, based on the regression analysis, we translate the estimated changes in the number of terminals into the growth in the value of card payments, which in turn allows us to calculate the value of crowded out cash payments and the resulting decrease in the size of the passive shadow economy.\(^\text{13}\)

The estimated impact of the regulation on the size of the passive shadow economy in the Czech Republic is presented in Chart 3.16. It is the highest for (1) the relatively large sectors (in which an increase in the prevalence of POS terminals significantly contributes to the growth in the total number of POS terminals in the economy) and (2) the sectors in which “saturation” with POS terminals is relatively low. The estimated effect is the highest for the sector of food, beverages and tobacco (a contraction of the passive shadow economy by 0.48% of GDP), followed by the restaurants, bars and cafes sector (0.31% of GDP). If the regulation applied to all the passive shadow economy sectors in the Czech Republic, the resulting increase in the registered activities should amount to 1.14% of GDP.

\(^{13}\) For more details on the applied approach and obtained results see Appendix 5.
The purchase or lease of POS terminals constitutes a major cost of the considered regulation. This cost may be borne by businesses, the government or shared between them. We consider two variants:

- at no cost to the government, in which we focus only on the impact of the regulation on government revenues;
- where the government finances 100% of the cost of installing new POS terminals, which is assumed to equal EUR 100 per device.

The estimated impact of this measure on government revenues is presented in Chart 3.17. In the variant in which the cost of the regulation is incurred by the government, the results are illustrated by changes in net government revenues.

The results show that even if the government were to cover the cost of the regulation, the net impact on government balance would remain positive for all the analysed sectors. If the regulation applied to all the sectors considered, government revenues should increase by CZK 12,508 m. However, if the government was to incur the cost of installing new POS terminals, the net effect on its revenues would be slightly smaller and amount to CZK 11,713 m.
**Chart 3.17. Obligation to operate POS terminals for selected types of businesses - impact on government revenues in the Czech Republic (m CZK)**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Change in government revenues (m CZK)</th>
<th>Change in net government revenues (m CZK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreation and culture</td>
<td>235</td>
<td>219</td>
</tr>
<tr>
<td>Transport (private and public)</td>
<td>400</td>
<td>373</td>
</tr>
<tr>
<td>Fuels for vehicles</td>
<td>699</td>
<td>658</td>
</tr>
<tr>
<td>Accommodation</td>
<td>997</td>
<td>929</td>
</tr>
<tr>
<td>Restaurants, bars and cafes</td>
<td>3,621</td>
<td>3,408</td>
</tr>
<tr>
<td>Food, beverages and tobacco (grocery stores, markets, etc.)</td>
<td>5,120</td>
<td>4,721</td>
</tr>
<tr>
<td>All passive shadow economy sectors</td>
<td>12,508</td>
<td>11,713</td>
</tr>
</tbody>
</table>

Source: EY

**Estimated timing of the impact of the regulation**

Most of the estimated impact should materialise almost immediately after the introduction of the regulation. Some effects may take place even before the introduction of the regulation, since some entities may start acting in compliance with the regulation soon after its announcement.
3.6 Tax incentives for consumers

**Mechanism of the regulation**

Another way to promote electronic payments is to make them financially more attractive for consumers compared to cash payments. This can be achieved by providing payment card users with special benefits directly related to their cards, such as discounts, cash-back or reward points redeemable for prizes. Such methods have been widely used by private financial institutions, and their effectiveness has been confirmed by a number of studies based on survey data. By analogy, such financial motivation may be provided by the government, for example, through appropriately designed tax incentives that reduce the tax component of retail prices such as VAT, provided that a consumer makes a card payment at the point of sale. This should then lead to a reduction in cash payments and, as a result, to a decrease in the size of the passive shadow economy and the resulting increase in government revenues (Chart 3.18). It should be stressed that such incentives for consumers may be introduced through various mechanisms, many of which allow the government to reduce incurred costs, but at the same time lower potential benefits in terms of crowded out cash payments.

A diagram illustrates the mechanism of the regulation—Tax incentives for consumers. The diagram shows how consumer card payments are rewarded with cash-back, alternative cost related to cash payments increases, crowding out of consumer cash payments by card transactions, and decrease in the size of the passive shadow economy. An increase in government revenues is followed by a decrease in the government balance. The government cost of financing cash-back through tax deduction is also illustrated.

An example of such a regulation is the programme introduced in South Korea in 1999, allowing the consumers to deduct from their income tax base 10% of the value of card transactions in excess of 10% of their total salary. At the same time, the deduction cap was set at the lower of KRW 3m or 10% of total annual salary. In the years that followed, both the deduction ratio and the annual income threshold were significantly raised. This mechanism allows the government to react (relatively) flexibly to the changing environment, and to control the level of incurred costs, though it also means that the effectiveness of this regulation in terms of reducing the passive shadow economy is lower than in the case of direct cash-back awarded to consumer card payments (the Korean regulation does not cover non-resident payments and requires some effort from the consumer to obtain benefits related to card payments).

Another example of this kind of regulation is Colombia, where consumers making card payments are entitled to a 2% VAT rebate. In the Czech Republic, no such regulation is in force. However, the Czech Government is currently engaged in a process of fiscalisation which may be supported by introducing the VAT refund.

An interesting variant of the tax deduction solution could be providing taxpayers with the ability to deduct a certain percentage of their card expenses on specific types of expenditure, up to a pre-defined limit set for a given tax year. These expenses could be deducted from the taxpayer’s income. In order to use such a PIT allowance, the taxpayer would need to document expenditures incurred by submitting card transaction receipts/bank statements. Alternatively, an appropriate electronic system might allow the automatic verification of such transactions. For example, in South...
Korea the confirmation of a taxpayer’s expenditure is available through the Simplified Year-end Tax Settlement website. This is an Internet-based service that shows the allowable amount of deduction that each taxpayer is allowed. A print-out of the screen displaying the records is a valid support document.

To combine the high efficiency of the considered solution, in terms of the shadow economy contraction, with limiting the costs of the tax relief incurred by the government, the regulation may focus on the selected sectors that account for the largest share of the passive shadow economy. Therefore, expenditure qualifying for the PIT allowance may be limited to certain sectors or predefined goods or services. In contrast, if the solution were implemented at a national level (covering all the sectors), this might be less effective in terms of reducing the shadow economy. The reason is that card payments made in non-shadow economy sectors may allow taxpayers to exploit the tax relief. Consequently, many consumers could fully benefit from this tax allowance without the need to replace their cash transactions in the shadow economy sectors with electronic payments. In such a situation, the regulation would entail only costs with no benefits for the government.

One of many examples of the regulation focusing on a selected sector is the construction/repairs allowance implemented in Poland. It allowed taxpayers to deduct 19% of their expenses incurred in 1992–2003 relating to house purchase, building and repairs. From 1997 onwards, a limit on this kind of expense was established.

Impact of the regulation on the passive shadow economy and government revenues

Although different variants of the consumer incentives discussed here have already been implemented in some countries, to the best of our knowledge no quantitative assessments of such measures are publicly available. Due to the lack of sufficient data for the countries where the analysed tax incentives were introduced, we use the available research on consumer reactions to card payments rewards. Based on these results, we run necessary transformations and calculate the effect of a given level of cash-back awarded to all card transactions on the reduction in the popularity of cash payments. For more details on the applied approach see Appendix 5.

We therefore analyse the impact of the tax relief, which is provided in the form of a cash-back equal to a given percentage of the card transaction value, on the increase in electronic payments and the respective decline in consumer cash transactions.

The quicker the tax relief works and the simpler construction it has, the higher is the chance that this condition will be satisfied. It is likely that, for example, an immediate benefit for the consumer in the form of a VAT deduction (corresponding to the predefined percentage value of a card transaction) would be more effective in stimulating card payments than complicated mechanisms of the tax refund based on the collection of payment card receipts, or the South Korean example of an income tax deduction. The latter mechanisms might allow the government to control regulation-driven costs more effectively, which is their great advantage, but at the same time would reduce the number of card transactions covered by the regulation and limit the interest of some consumers in the implemented solution due to the additional administrative burden.

The analysed regulation not only provides benefits in the form of the contraction of the shadow economy and the resulting increase in government revenues, but it also entails costs in the form of reduced government revenues per registered card transaction, due to deducting a fraction of the tax burden. The illustration of the relationship between the tax relief level and the associated costs and benefits is demonstrated in Chart 3.19.

Note that the potential benefits of the regulation for government revenues are proportional to the fall in the value of shadow economy transactions, which in turn is proportional to a decrease in cash usage by consumers. The flat benefit line indicates the area where the passive shadow economy no longer exists, and thus there are no additional benefits from a further increase in the level of tax relief. The shape of the cost curve is determined by the following two factors: the value of the tax benefit (as a percentage of the card transaction value) and the overall value of card payments. Therefore, an increase in the level of cash-back awarded to consumer card payments elevates the costs incurred by the government, because this encourages an increase in the value of card transactions, and each unit of card payment is now rewarded with a higher prize. When there are no more consumer cash transactions to be crowded out by card payments, the cost curve becomes linear.

We therefore seek the optimum level of the tax incentive for consumers that maximises the difference between the benefits and costs of the regulation in the Czech Republic. It has been estimated at the level of 3.1% of the card payment value. The results are presented in Chart 3.20, which shows that this regulation seems to have a significant potential to reduce the shadow economy (by 6.0% of GDP) and increase government revenues in the Czech Republic (with the net effect of CZK 27,088 m).
Chart 3.19. The impact of the tax relief for consumer card payments on the government balance – an illustrative example

From this moment on, there is no crowding out of the passive shadow economy

The break-even scale of intervention

The optimum scale of intervention

Source: EY

Reducing the Shadow Economy through Electronic Payments. CZECH REPUBLIC | 33
While the effects of this regulation seem to be very promising for the Czech Republic, the major concern, from the perspective of public finance, might be that it entails certain and quite significant costs, while the benefits – although estimated to be much higher – take the form of potential additional revenues. Therefore, further research dedicated to and accounting for the specifics of the Czech economy, including the behaviour of domestic consumers and their reaction to financial incentives, might be desirable. Moreover, there may be interest in adopting a solution that would allow the government to control the cost of the regulation more effectively. In this context, an example worth considering is that of South Korea, where an income tax deduction mechanism, including a deduction cap, was introduced. However, this is just one of many variants of this regulation, which may be modified in many ways.

**Estimated timing of the impact of the regulation**

A significant part of the estimated impact that is related to the behaviour of current cardholders should take place almost immediately after the regulation has been introduced. For those who do not own a payment card, the effects may emerge more gradually (and should materialise almost completely within 1-2 years, according to our expert judgement). It is also likely that a relatively high tax incentive would accelerate this process (higher benefits should encourage people to apply for payment cards more quickly).

The effects that the considered regulation will have over time may also play a critical role in the cost-benefit analysis. It might be assumed that after many consumers have shifted from cash to card payments as a result of the cash-back incentive, their payment habits may often change permanently. Therefore, if the government reduces the level of the tax incentive, or even withdraws from the regulation completely, a significant proportion of consumers may not be willing to shift back to cash payments. Consequently, the costs of the regulation may be reduced (or eliminated) over time with a limited impact on the achieved benefits. Therefore, net effects of the regulation on the government balance may increase over time.
3.7 Tax incentives for merchants

Mechanism of the regulation

In many countries, consumers are discouraged from using cards because of the limited number of places where cards are accepted. The slow development of POS terminals network can be a result of the high costs of accepting card payments in some countries. On the other hand, large fees imposed on merchants may be an effect of the insufficient prevalence of electronic payments in the economy; if relatively few people make card payments, the maintenance costs incurred by merchants are divided over a small number of transactions, resulting in large fees per transaction for merchants.

In such cases, tax incentives decreasing the cost of accepting card payments by merchants may stimulate the growth of electronic payments, thus leading to a reduction in cash transactions. This, in turn, would translate into a contraction of the passive shadow economy and a subsequent increase in government revenues (Chart 3.21).

Chart 3.21. Mechanism of the regulation – Tax incentives for merchants

An example of merchant-targeted policies is the experience of South Korea, which introduced VAT deduction and income tax deduction schemes (the latter abolished in 2011), both providing merchants with tax benefits for accepting card payments. The VAT deduction ratio (accompanied by a deduction cap) has varied over time and across categories of goods and services. Another example is Uruguay, where a two percentage point VAT deduction on electronic payments accepted by merchants has recently been introduced. In the Czech Republic, no such regulation is in force.

In order to reinforce the effects of the considered regulation, other incentives provided for merchants might be considered. They may take the form of tax allowances, granted EU Funds or government (co)financing for the purchase of POS terminals (for example, in Poland the cost of purchasing cash registers could partially be deducted from the company’s VAT liability).

Moreover, merchants accepting card payments could be exempted from the obligation to issue a fiscal receipt for such transactions.
Taking into account the current level of payment infrastructure development in the Czech Republic, only slight adjustments would be required to enable such an exemption if the payment was made electronically (see also section 3.5). This solution could also be supported by the introduction of dual POS terminals that can be used as cash registers (as, for example, in Croatia).

**Impact of the regulation on the passive shadow economy and government revenues**

Using the econometric model described in Appendix 5, we have estimated how changes in merchant costs affect the value of card transactions. In the next step, we translate the increase in consumer card payments into a decrease in consumer cash payments and calculate the resulting change in the Czech passive shadow economy. The reduction in the passive shadow economy is associated with a growth in government revenues. However, similarly to the tax incentive for consumers, the regulation considered here provides not only benefits in the form of shadow economy contraction and the resulting increase in government revenues, but also costs in the form of reduced government revenues per registered card transaction, due to deducting a fraction of the tax burden. The relationship between the tax relief level and the associated costs and benefits is illustrated in Chart 3.22. The reasons for the constant slope of the benefits curve and the increasing slope of the costs curve are the same as described in the section on tax incentives for consumers.

**Chart 3.22. The impact of the tax relief (as % of card payments value) for merchants on the government balance - an illustrative example**

Source: EY

We therefore seek the optimum level of the tax relief for merchants that maximises the difference between the benefits and costs of the regulation in the Czech Republic. It has been estimated at the level of 2.2% of the card payment value. The results, presented in Chart 3.23, show that the reduction of the shadow economy (by 1.8% of GDP) and the increase in government revenues generated by this regulation are lower than in the case of the previously discussed tax incentives for consumers. Nevertheless, the net impact on government revenues (CZK 5,576 m) is still non-negligible.

While we opt for a conservative approach in every situation subject to uncertainty, we have to admit that for this particular regulation the presented impact on government revenues may have been overestimated. The reason is that the estimated optimum level of the tax relief seems to be too low to incentivise
those merchants that benefit much more from not reporting some cash transactions to start registering these transactions by accepting card payments. Therefore, it is likely that it would be mostly those merchants that have so far registered cash transactions that may have the strongest motivation to replace cash transactions with card payments. In the latter case, however, the shift into electronic payments would not reduce the passive shadow economy, since crowded out cash payments were already reported and included in the registered tax base. Taking that into account, and the fact that in our approach we assume that a given percentage of crowded out consumer cash payments leads to a proportional decline in the passive shadow economy, the obtained results for the impact of the regulation on the contraction of the shadow economy and increase in government revenues may be overestimated.

Chart 3.23. The impact of the optimum tax relief for merchants (2.2% of card payment value) on government revenues in the Czech Republic

On the other hand, it can be claimed that this regulation should contribute to the development of card payment infrastructure and stimulate electronic transactions. When the card network is sufficiently developed, the maintenance costs (in terms of fees per transaction) should be reduced and tax incentives for merchants may no longer be necessary. The government may therefore withdraw from the regulation and no longer incur the cost of tax relief. In this context, the regulation may be considered as an investment in payment infrastructure.

As with the regulation on tax incentives for consumer card payments, the tax relief for merchants entails certain, and quite significant costs, while the benefits - although usually estimated to be higher - take the form of potential additional revenues.

Therefore, further research dedicated to and accounting for the specifics of the Czech economy, including the behaviour of domestic merchants and their reaction to financial incentives, might be desirable.

Estimated timing of the impact of the regulation

A significant part of the estimated impact concerning the behaviour of merchants who already operate POS terminals should take place almost immediately after the regulation has been introduced. For those merchants who do not have POS terminals, the effect will materialise more gradually. It is also likely...
that a relatively high tax incentive would accelerate this process. However, it might take some time for consumers to get used to the improved card acceptance network and to use cards more frequently.

Effects that the considered regulation will have over time may also play a critical role in the cost-benefit analysis. For it might be assumed that, after the card acceptance network has been improved as a result of the tax incentive for merchants, this process would not be reversed even if the government reduced the level of the tax incentive, or even completely withdrew from the regulation. Consequently, the costs of the regulation may be reduced (or eliminated) over time, with a limited impact on the achieved benefits. Therefore, the net effects of the regulation on the government balance may increase over time.
3.8 Receipt lotteries

Mechanism of the regulation

The idea of receipt lotteries is to reduce the passive shadow economy by limiting unreported transactions through the increased issuance of receipts in business-to-consumer transactions. Specifically, consumers are provided with an incentive to ask for a receipt, as it may also serve as a free of charge ticket in receipt lotteries, thereby giving its holder a chance to win attractive prizes. In the longer perspective, this measure is aimed at getting consumers used to asking for fiscal receipts. It is often assumed that, after a certain period of time, people will develop such a habit (e.g., by making asking for receipts socially acceptable and desirable, or by raising awareness of the benefits of combating the shadow economy) and thus will continue to demand fiscal receipts even without such an additional monetary incentive.

National receipt lotteries have been introduced in several countries (starting from Taiwan in the early 1950s) in order to increase the issue of receipts in consumer transactions. In Slovakia, Malta and Portugal, the lottery is considered a continuous solution, whereas in some other countries, it is designed to run only for a specific period of time. For instance, in Poland the programme has been explicitly introduced for 12 months. In South Korea, a cash receipt lottery was organised for several years but was discontinued in 2010 after user involvement reached a desirable level. Another example is Croatia, where several rounds of VAT lotteries have been organised, though not on a regular basis and on a relatively small scale (usually as part of the national educational campaigns to raise awareness of the existence of the shadow economy).

The introduction of receipt lotteries in the Czech Republic is planned together with the Act on evidence of revenues. This piece of the legislation aims at limiting the shadow economy and increasing the awareness of the customers, who should insist or pay attention to receive a proper bill from the seller, including the unique code on the bill. The lottery will be organised by the Ministry of Finance. A person will be allowed to participate in the lottery only if he or she has provided a receipt or required data from the receipt. Expenses for the organization of lottery will be covered by the government.

It must be emphasized that the impact of receipt lotteries on the shadow economy may be twofold. Firstly, it is likely to have an impact on customers’ “demand for receipts”, and hence directly reduce the number of unreported transactions, and secondly, it can increase (at least to some extent) the propensity of merchants to accept electronic payments. In these new circumstances, in which more transactions have to be registered after all, card payments are not as unattractive for merchants when compared to registered cash payments, as they would be when compared to unregistered cash transactions (Chart 3.24).

Chart 3.24. Mechanism of the regulation - receipt lotteries

Source: EY
Impact of the regulation on the passive shadow economy and government revenues

In order to assess the impact of the considered regulation, we use an econometric model as described in Appendix 5. While receipt lotteries turn out to have some positive impact on electronic payments (and through that channel also on the passive shadow economy), no quantitative conclusions on the strength of this impact can be drawn. More details on the applied approach and obtained results may be found in Appendix 5.

It is very likely that receipt lotteries are an efficient instrument in combatting the passive shadow economy in a direct way, i.e. by reducing the number of unreported cash transactions, since merchants should be more often requested to issue receipts. However, the scarcity of historical experience, and thus insufficient data, do not allow us to provide a quantitative evidence of such a relationship. The challenge of data availability is additionally reinforced by the wide range of possible implementations of receipt lotteries (differing, for example, in terms of ease of participation, number and value of expected rewards etc.).

Consequently, receipt lotteries is the only measure in this study whose economic impact could not be estimated.

Potential costs of the regulation

The main costs of this measure are linked to prizes and the expenditures related to the organisation of the lottery, such as setting up a website, etc. However, the overall value of prizes offered in the lottery should be low in relation to the expected gains in terms of additional tax inflows from newly registered transactions. Moreover, such costs can easily be controlled by the regulator.

Estimated timing of the impact of the regulation

The direct effects of lotteries should be visible almost immediately after the introduction of the regulation. However, the assessment of how many receipts have been recorded only due to the lottery remains hard to estimate.
According to EY’s estimates, the level of the shadow economy in the Czech Republic, approximated by unreported cash transactions, amounted to 11.3% of GDP in 2014. The passive component of the shadow economy was estimated at 10.3% of GDP, and thus accounted for the vast majority of unregistered activities in the Czech Republic. Potential government revenues from eliminating the passive shadow economy in the Czech Republic amount to 2.6% of GDP or CZK 109.3 bn. Consequently, even a partial success in dealing with this category of unreported transactions can significantly improve the public finance situation.

The passive shadow economy can be addressed through: (1) the promotion of electronic payments, which replace consumer cash transactions, or (2) control and execution measures increasing the share of reported consumer cash payments. There is a wide range of potential regulatory measures that may be considered in order to reduce the passive shadow economy in the Czech Republic. Many of such solutions have already been implemented in other countries.

The impact of the considered measures on the contraction of the shadow economy varies with the analysed instrument. The most efficient regulation is the provision of financial incentives to consumers to use electronic payments, which may contribute to the reduction of the passive shadow economy in the Czech Republic by 6.0% of GDP. This regulation is also the most beneficial in terms of its impact on government net revenues, which amounts to CZK 27,088 m.

Consumer cash payment thresholds may be regarded as a different category of the analysed measures, since, if established at a very low level (controversial though it may be), they may almost completely eliminate the passive shadow economy by crowding out a large share of the existing consumer cash payments. In this context, it should be emphasised that the thresholds considered here are presented as nothing more than examples of different limits on the maximum value of consumer cash payments. While we agree that the presented limits, especially the lowest ones, may seem unacceptable and hardly feasible to implement, they well illustrate how the impact of this regulation varies with a change in their level. Moreover, as confirmed by our analysis, establishing high thresholds for consumer cash payments would have little, if any, impact on the passive shadow economy.

The obtained results, presented in Chart C1 and Chart C2, show that an increase in the popularity of electronic payments may play an important role in addressing the problem of unreported activities in the Czech Republic. At the same time, the considered measures differ in terms of their efficiency and the difficulty of their implementation. In general, the more efficient instruments - in terms of their impact on the shadow economy contraction and
increase in government revenues – seem to be more difficult to implement (Chart C3).

Finally, we have to emphasise that each of the presented measures should be regarded as just one of many possible variants of a given regulation. Since these solutions may be modified in terms of their scope, timing and other parameters, their actual impact would change accordingly and depend on the final decision of the Czech regulators. Consequently, the measures analysed in this study should not be treated as recommendations, but rather as examples illustrating the effects of potential regulations that may be considered by policymakers in their attempt to address the issue of the passive shadow economy in the Czech Republic.

Chart C1. Summary of the impact of the analysed regulations on the passive shadow economy in the Czech Republic (as a percentage of GDP)
Chart C2. Summary of the impact of the analysed regulations on the net government revenues in the Czech Republic (m CZK)

<table>
<thead>
<tr>
<th>Regulation</th>
<th>General government revenues change (m CZK)</th>
<th>Net general government revenues change (m CZK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold for consumer cash payments - 1000 CZK</td>
<td>23,644</td>
<td></td>
</tr>
<tr>
<td>Threshold for consumer cash payments - 1500 CZK</td>
<td>12,256</td>
<td></td>
</tr>
<tr>
<td>Threshold for consumer cash payments - 2000 CZK</td>
<td>6,942</td>
<td></td>
</tr>
<tr>
<td>Threshold for consumer cash payments - 2500 CZK</td>
<td>1,628</td>
<td></td>
</tr>
<tr>
<td>Tax incentive for consumers - optimal tax relief: 3.1% of card payment value</td>
<td>10,579</td>
<td>65,165</td>
</tr>
<tr>
<td>Tax incentive for consumers - 0.5% of card payment value</td>
<td>8,042</td>
<td></td>
</tr>
<tr>
<td>Tax incentive for merchants - optimal tax relief: 2.2% of card payment value</td>
<td>5,576</td>
<td>19,434</td>
</tr>
<tr>
<td>Tax incentive for merchants - 0.5% of card payment value</td>
<td>2,359</td>
<td></td>
</tr>
<tr>
<td>Obligation to operate POS terminals: all passive shadow economy sectors</td>
<td>12,508</td>
<td>11,713</td>
</tr>
<tr>
<td>Obligation to operate POS terminals: food, beverages and tobacco (grocery stores, markets, etc.)</td>
<td>4,721</td>
<td></td>
</tr>
<tr>
<td>Obligation to operate POS terminals: restaurants, bars and cafes</td>
<td>3,621</td>
<td></td>
</tr>
<tr>
<td>Obligation to operate POS terminals: accommodation</td>
<td>3,458</td>
<td></td>
</tr>
<tr>
<td>Obligation to operate POS terminals: fuels for vehicles</td>
<td>999</td>
<td></td>
</tr>
<tr>
<td>Obligation to operate POS terminals: transport (private and public)</td>
<td>699</td>
<td></td>
</tr>
<tr>
<td>Obligation to operate POS terminals: recreation and culture</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Obligation to operate cash registers</td>
<td>373</td>
<td></td>
</tr>
<tr>
<td>Obligation to make an electronic payment of pensions</td>
<td>235</td>
<td></td>
</tr>
<tr>
<td>Obligation to make an electronic payment of wages and salaries</td>
<td>219</td>
<td></td>
</tr>
<tr>
<td>Obligation to make an electronic payment of unemployment benefits</td>
<td>5,671</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5,059</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,383</td>
<td></td>
</tr>
<tr>
<td></td>
<td>113</td>
<td></td>
</tr>
</tbody>
</table>

Source: EY
Chart C3. Effectiveness vs. difficulty of implementation of the analysed regulations in the Czech Republic

Notes: The size of the circle reflects the net impact of a given regulation on government revenues
Source: EY
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