

Nudging small-scale self-employed entrepreneurs: The impact of encouraging taxpayers to choose higher tax contribution in the hope of having higher pensions.

Analysis plan

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Abstract

We conducted a large-scale randomized controlled trial among a population of Hungarian self-employed entrepreneurs who are subject to an elective simplified tax regime where they can choose between lower monthly tax payments with lower future social security benefits, and higher payments with higher future benefits. In the trial they received letters describing the differences between these regimes and a short explanation on expected differences in future pensions. Based on the literature and previous behavioural experiments, we expect this intervention to increase the probability of choosing the higher contribution option. We will estimate the local average treatment effect will be positive among those who open the letter. The effect of different letter types will be also measured, and the difference between reactions on potential gains and losses will be also quantified.

1 Background and policy environment

1.1 KATA, a lump-sum tax for small-scale self-employed entrepreneurs

Since 2013, small-scale self-employed entrepreneurs in Hungary can opt for a simplified lump-sum taxation regime called KATA (*kisadózók tételes adója*) which covers all income taxes and social security obligations payable to the central government for a monthly tax of HUF 50,000 (approx. 170 USD). From the perspective of taxpayers, the main benefits of this regime (beside lower compliance costs) are significantly lower social security contributions compared to regular income tax and social security regimes. However, these also result in lower social security benefits, including lower paid medical leave, unemployment insurance, and pensions.

However, KATA taxpayers can also opt for a higher contribution of HUF 75,000 per month (approx. 260 USD) which raises expected pensions at retirement by 10-40%, depending on the age of the taxpayer. This option was introduced in 2014. Currently this higher bracket is chosen by around 5% of full time KATA taxpayers. KATA taxpayers can opt-in to, or opt-out of the higher bracket, and the new option will be active from the month following the day of the switch.

There is a third type of KATA at HUF 25,000 per month, which is only available for entrepreneurs who are full time employed (and therefore pay full social security contributions as an employee) or those who are retired.

1.2 The Hungarian pension system

The above differences between KATA and regular tax regimes influence all types of social security benefits but our intervention focused mainly on pensions.

Social security in Hungary has a pay-as-you-go pension system. Every employed, or self-employed person is required to contribute. The amount of future pension payments indirectly depends on contributions. The

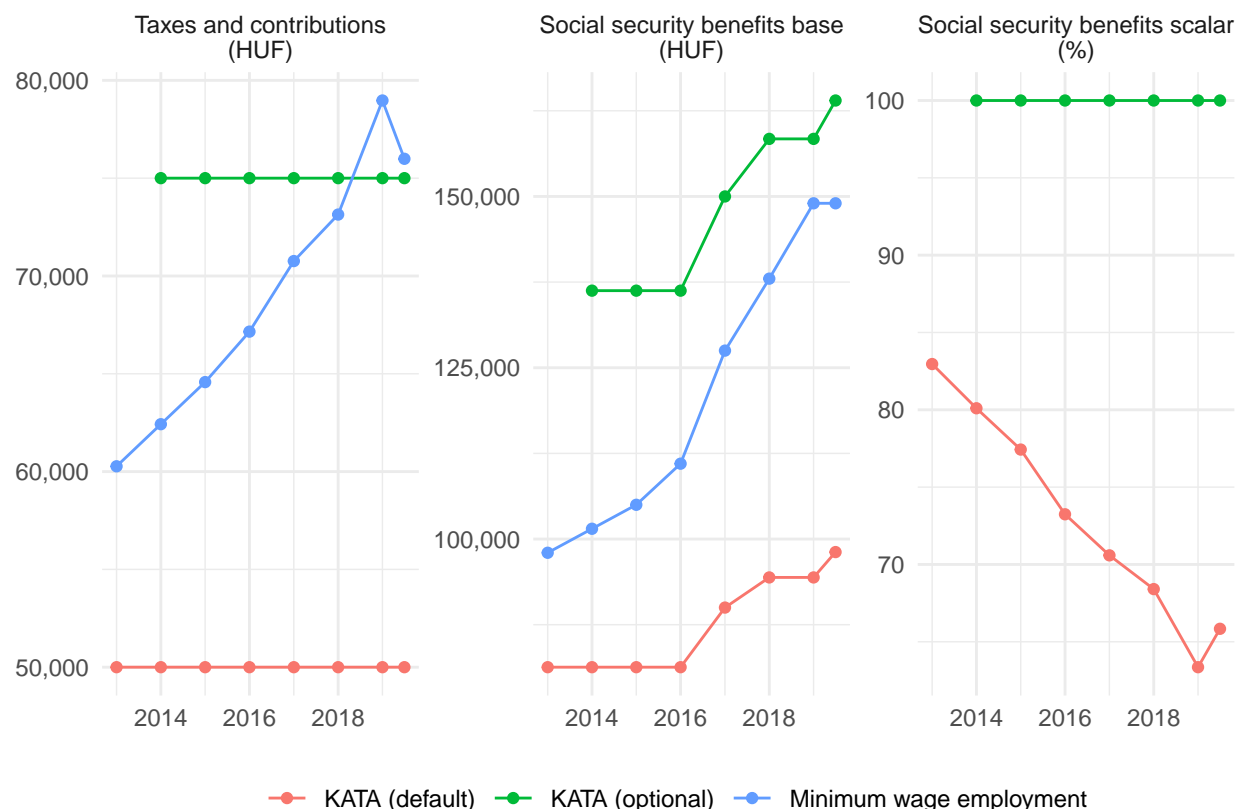


Figure 1: KATA tax rates and social security benefits parameters

actual level is determined by complex formulas but in the general case – for employees and non-KATA entrepreneurs – the main factors are the following two steps.

First, the number of years spent in the labour market are used to set a *benefits scalar* which gives bonuses for working longer. This is calculated by a function that is increasing in the number of years worked but the applicable years are reduced for periods when a person had social security benefits below contributions payable on the minimum wage. In the second step the *benefits base* is determined using average after tax lifetime earnings. These are calculated in current prices with average wage growth indexation. In the period between 2013 and 2019 wage growth was significantly higher than inflation. The total amount of pension is the product of the scalar and base.

KATA entrepreneurs pay a lump sum tax, and don't have direct social security contributions. Therefore their contribution levels have to be defined separately by law. This is set in nominal terms and is not indexed automatically. At the time of KATA's introduction it was set in proportionally to the sum of taxes and social security contributions paid on the minimum wage (Figure 1).

In the following years, the minimum wage was raised significantly, in total by 52% while KATA was unchanged. This widened the gap between KATA and the standard regimes in tax obligations and also decreased the basis for pension assessment.¹ Contributions paid on the minimum wage caught up with the optional KATA but the higher KATA option still maintained its advantage in terms of social security benefits base. The higher KATA offers the same scalar as minimum wage employment (as its contributions are higher than contributions on the minimum wage), while the default KATA's scalar decreased continually.

¹The widening gap was partly offset by the fact that the minimum wage was raised in parallel with decreasing the employers' social security contributions. This meant that compared to before the higher minimum wage, an unchanged KATA mechanistically "paid more" in social security contributions. This change was reflected in the statutory KATA contribution level.

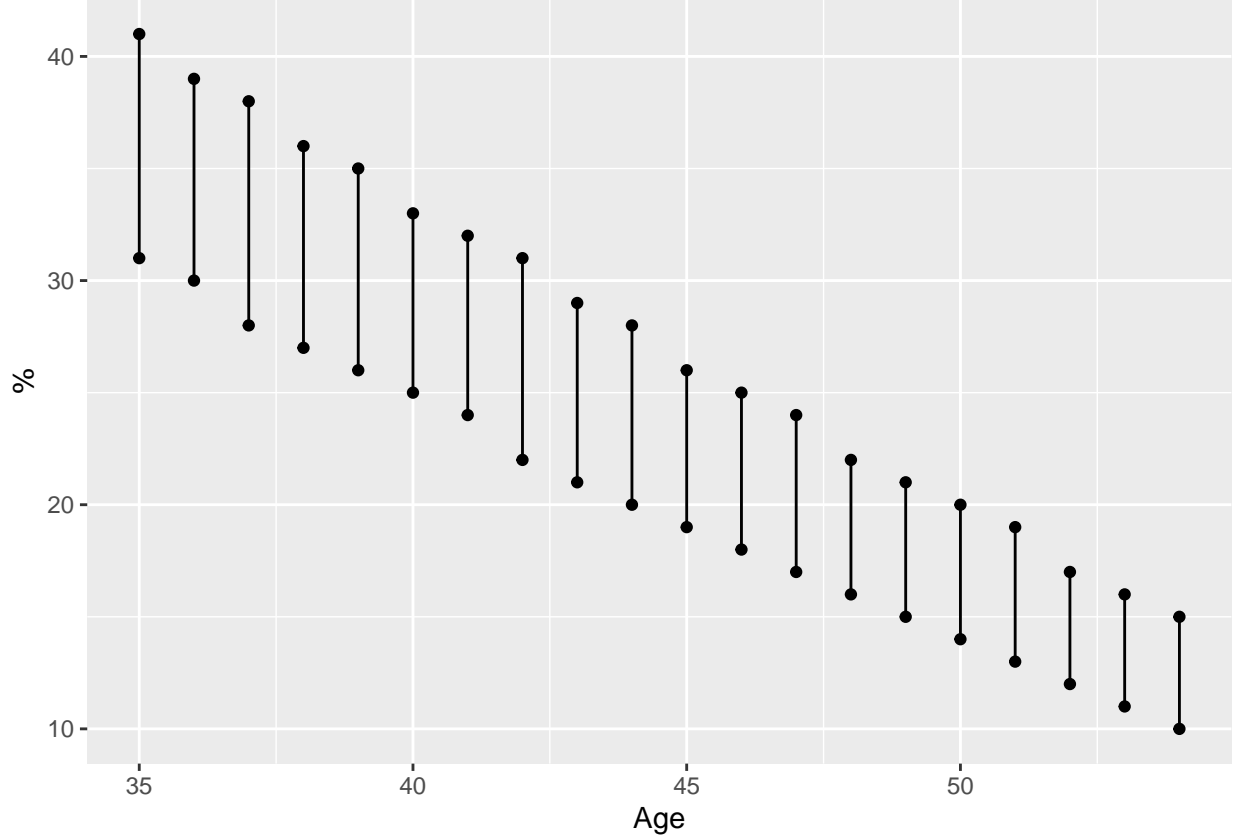


Figure 2: Expected differences in pension after retiring from the default KATA bracket and the optional higher bracket. The letters showed an interval with the low and high estimate.

2 Interventions

In this experiment we sent plain language letters to KATA taxpayers in a randomized controlled trial about the availability of the higher KATA bracket, explaining the details with instructions how to opt for this bracket.

We sent four different types of letters in the combination of the following variants.

Generic, or personalized Generic letters only contained information on the optional regimes, while individualized letters included a calculation on the difference between expected pensions after retiring as a KATA entrepreneur at retirement age (65 years), and expected pensions after retiring from the higher bracket KATA. The calculation was based on the microsimulation model of the Social Security Administration but these are highly simplified calculations as only on the age of the subject was taken into account. To show the uncertainty, every personalized letter included a range (see Figure 2). We assumed taxpayers will continue working as self-employed in the KATA scheme with no changes in the tax of social security system (apart from basic indexation of some variables).

Gain, or loss The opening sentence of the letters had two variants. In the first the choice of opting for the higher bracket was presented as a potential gain in expected pensions. In the second type the choice was presented as an avoidable loss in expected pensions, relative to staying in the default regime.

See Appendix A.1 for sample letters in Hungarian.

Subjects were selected for the trial from the total population of KATA entrepreneurs based on administrative records at the tax office. The trial population included only those who are active as sole proprietors (a legal

Table 1: Sample sizes in the trial

Treatment type	n	percent
Treatment (generic, gain)	20394	20.0%
Treatment (generic, loss)	20394	20.0%
Treatment (personalized, gain)	20394	20.0%
Treatment (personalized, loss)	20395	20.0%
Control	20394	20.0%

category of entrepreneurship in Hungary)² and pay the HUF 50,000 KATA. The population was restricted to taxpayers between the ages of 35 and 54. Personalized letters could not be sent to subjects younger than 35 because estimates for entrepreneurs this early in their careers would be highly uncertain. Subjects older than 54 would see a negligible increase in expected pensions, as higher contributions for less than 10 years before their retirement affect the difference between the two options only marginally. It is also common for people close to retirement to consult with the Social Security Administration, where they receive a precise estimate for their expected pensions. This is calculated using exact lifetime earnings and the actual number of active years. Both our rough, age-based estimates and our generic letters could have been misleading in these cases.

The trial had five arms with the four types of letters and a control group who didn’t receive a letter. Assignment to treatment was done in a complete random assignment with equal probability to all arms using the `randomizr` package in R. See Table 1 for sample sizes of assigned treatment.

Letters were sent only once and all subjects received it in their e-Government accounts on 26th June 2019. All communication between the tax office and taxpayers participating in this trial is done electronically through e-Government accounts, therefore they should be familiar with this method. However, many documents are left unread.³ For taxpayers who have a registered accountants (see Section 3.3 for details), the accountants were also notified.

Final treatment can differ from assignment. Based on experience from previous trials in similar settings and on similar populations, a few subjects usually close their businesses between randomization and intervention, or their e-Government accounts become unreachable. These cases usually amount to less than a few dozen subjects. They will be left out of the final analysis.

Taxpayers who don’t download the letter from their e-Government account won’t receive the intended treatment. This can be controlled for, as we will have data on the date of opening the letter (see Section 3). Subjects can share information received in the letters with other KATA entrepreneurs. This is not observable but we will use accountancy networks (taxpayers who share the same accountant) to examine a subset of possible spillover effects. Additionally, the control group might be contaminated, as some publications – including specialised publications for tax advisors and accountants but also some mainstream newspapers – picked up on the story after the letters were sent. Articles quoted the text of the letters and offered further advice.⁴ Therefore the baseline of the intervention is the non-observable exposure to these factors.

Data on switching to the higher bracket was collected until 30th September 2019 when the trial was concluded. Response data will be available for analysis later in October 2019.

²Some partnerships can opt for KATA, who amount to less than 10% of all KATA taxpayers. They were not included, as directly addressing partners in a partnership was not feasible in this trial.

³Taxpayers are notified by email on receiving a document in their e-Government inbox but this email contains only the subject and sender of the document. To view the actual content, taxpayers must log in and download the letter from the e-Government inbox.

⁴Communication of this type from the tax office was not common before our trial. Prior communication was usually limited to matters directly related to tax obligations and did not address topics to either raise awareness of certain issues, or to give additional information. Therefore these letters might have been considered newsworthy.

3 Treatment effects

Our outcome variable of interest is the binary choice of opting for the higher KATA bracket during the trial period. We will estimate the average treatment effect on the treated and also the average treatment effect of each letter type.

This outcome can be interpreted as purely the choice for contributing more to the state pension system but this is not the only possible reaction. Receiving the information in the letters sent during the trial could also motivate subjects to save more, which could achieve higher returns than contributing more to a pay-as-you-go pension system. However, data on other forms of personal savings is not available which is a major limitation of our study.

It is also conceivable that some subjects will switch to the part time, HUF 25,000 KATA, or stop being KATA subjects at all. The former behaviour is only possible if the subject already had another full-time job, or started working in a full-time job. We will do robustness checks including and excluding them from our analyses.

3.1 Local average treatment effect

Previous trials in similar settings suggest that only around 70% of letters sent by the tax administration are opened. The complier and non-complier subpopulation in our trial is likely to differ in unobservable characteristics. As we will have data on opening the treatment letters, we will use the random treatment as instrument to estimate the local average treatment effect on the compliant population.

3.2 Heterogeneous effects

Our trial was not stratified but sample sizes are sufficient for subgroup analyses. We investigate differences along variables described in the following subsections. The policy setting suggests some heterogeneity but generally there aren't strong, theory-motivated forms of heterogeneity in our trial. To avoid potentially false findings in testing multiple hypotheses, we will apply a machine learning approach with causal trees to select the variables for which we will estimate heterogeneous responses.

3.2.1 Age and sex

As described in Subsection 1.2 and shown on Figure 2, age is a major factor in the difference between pension expectations for default and optional KATA regimes, thus it could be important in the decision to opt for the higher bracket.

The Hungarian pension system does not differentiate in pension benefits between men and women but women can retire after 40 years of paid work (which also includes childcare leave). It was not mentioned in our letters but it is a well known scheme (called Nők 40), and women planning for an early retirement could show a different behaviour. Additionally, women often spend more time out of the workforce. Since the difference in expected pensions between staying in the default KATA, or switching to higher KATA payments is bigger for people with and fewer active years, this could also cause different behaviour between men and women.

Data on sex is not directly available for our trial, as it is not recorded by the tax authority for KATA taxpayers. However, personal income tax returns have a mandatory field on sex. KATA taxpayers don't have to file income tax returns, however KATA has been in force only since 2013, thus most KATA taxpayers had filed income tax returns in the past.⁵ This will introduce some missingness in our data, as past non-filing is not random. However, this additional heterogeneity can also be explored (Table 2).

⁵Tax regimes where self-employed have no obligation to file PIT returns didn't exist before KATA.

Table 2: Sample sizes by age and sex in the trial

Age/Sex	Male	Female	Unknown
34–40	54.1% (14700)	41.0% (11134)	4.9% (1317)
40–45	53.4% (17272)	42.3% (13691)	4.3% (1380)
45–50	52.7% (13214)	43.1% (10813)	4.3% (1070)
50–55	54.8% (9531)	40.9% (7110)	4.3% (739)

Table 3: Sample sizes by industry in the trial

NACE industry	n	percent	cumulated
Construction	17401	17.1%	17.1%
Other service activities	17019	16.7%	33.8%
Professional, scientific and technical activities	15453	15.2%	48.9%
Wholesale and retail trade	10056	9.9%	58.8%
Manufacturing	7703	7.6%	66.3%
Administrative and support service activities	7000	6.9%	73.2%
Information and communication	5146	5.0%	78.2%
Education	4854	4.8%	83.0%
Transportation and storage	4331	4.2%	87.2%
Arts, entertainment and recreation	3487	3.4%	90.7%
Financial and insurance activities	3163	3.1%	93.8%
Accommodation and food service activities	2582	2.5%	96.3%
Human health and social work activities	2266	2.2%	98.5%
Real estate activities	1416	1.4%	99.9%
Other	94	0.1%	100.0%

3.2.2 Industry and revenue

Educational attainment correlates with the length of lifetime working years and earning potential (i.e. outside options) that could influence decisions on optional higher social security payments. While educational background is not observable in our trial population, industry composition suggests a wide range of educational attainment among KATA entrepreneurs. Table 3 shows that across NACE major groups other service activities (mainly hair salons) are the most popular industry in our trial population, followed by construction and professional services, with retail also prominent.

We will also look at the effect of business size. KATA is a lump-sum tax with simple administration, which means we won't have either detailed information on business operations, or other proxies for income. However, KATA taxpayers have to file an annual tax return declaring their revenue, as revenue exceeding HUF 12 million is liable to a 40% tax. There is strong bunching below this threshold and also below the HUF 8 million threshold of the small business VAT exemption (see Figure 3). KATA gained popularity in recent years, which means, many KATA businesses were founded in 2018, or 2019. They did not report revenue for the entire calendar year of 2018, or didn't report at all. In our analysis we will investigate heterogeneous response to treatment both by industry codes, date of founding, and revenue.

3.3 Spillover effects through accountancy networks

Anecdotal evidence suggests that tax preparers and accountants can play an important role in the behaviour of taxpayers. We will investigate whether switching to the higher KATA option propagated through accountancy networks.

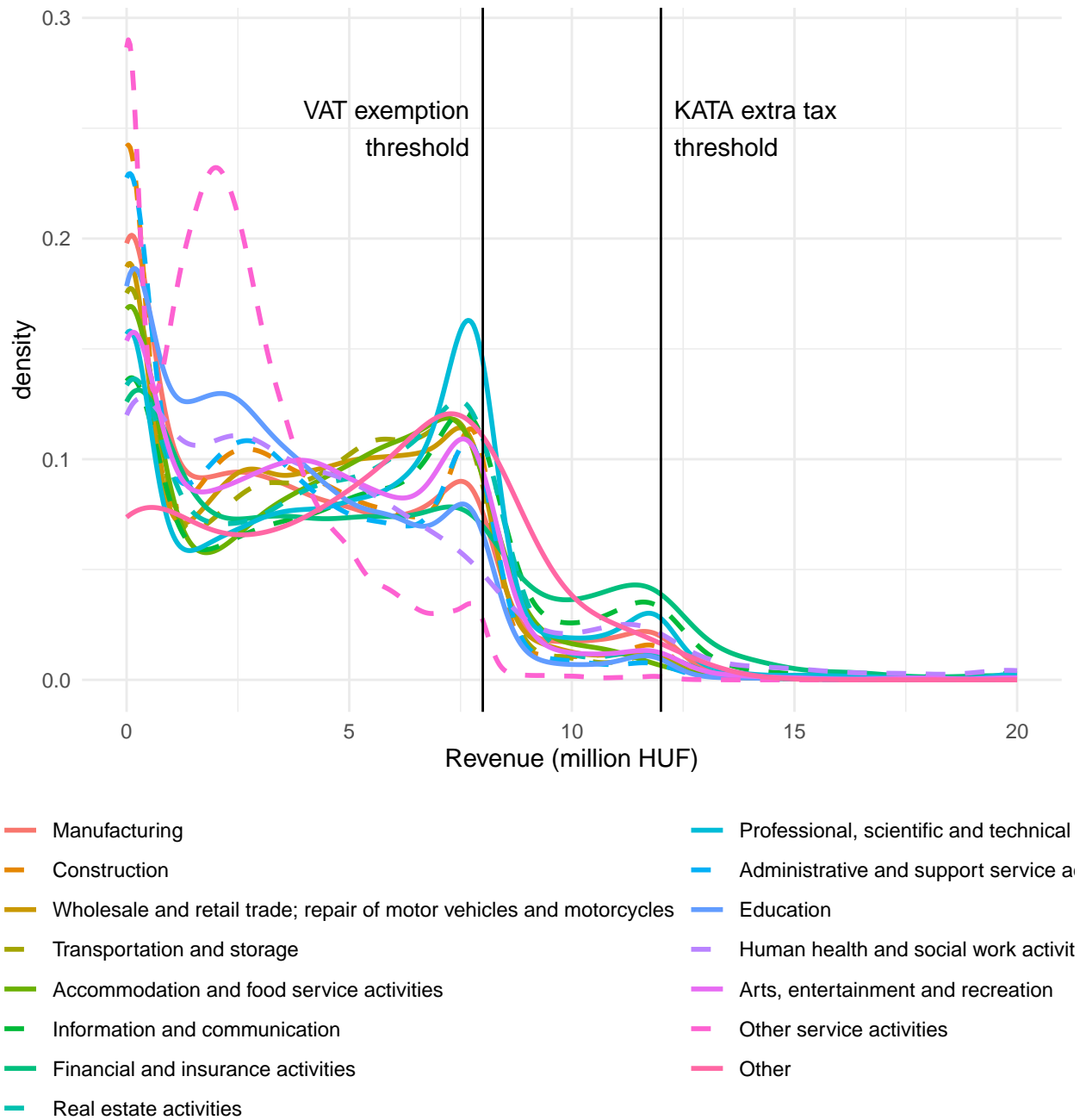


Figure 3: 2018 business revenue of the trial population

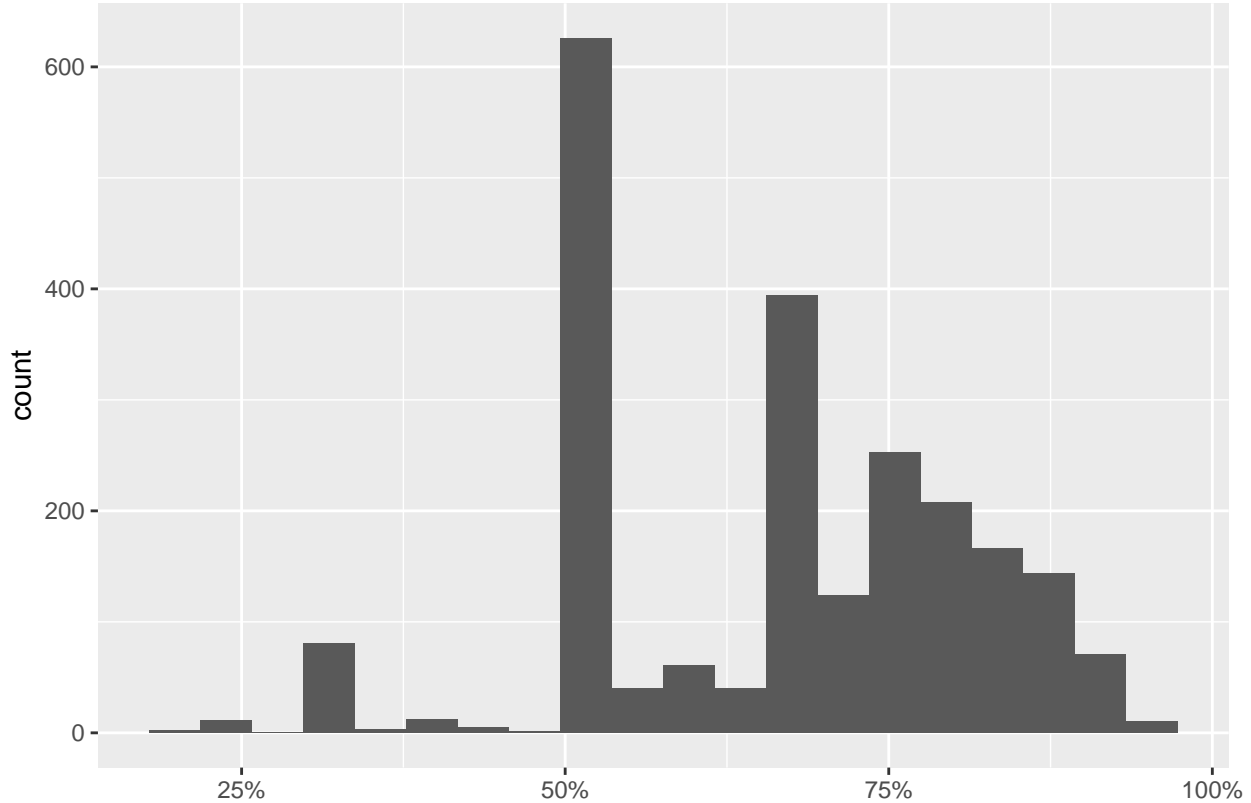


Figure 4: Share of treated subjects by accountant-cluster

Taxpayers can register their accountants at the tax administration as their permanent representative, which allows accountants to file their clients' taxes and represent them in certain administrative procedures. We sent the letters directly to taxpayers but anonymized IDs of registered accountants which we will use to link taxpayers with the same accountant.

This data was not used at randomisation but our trial was sufficiently large to have enough observations for this network analysis. 76% of the trial population didn't have a registered representative, 5% had a unique representative, therefore the cluster size is one, and in 6% of the sample we don't have any variability in the clusters, as all subjects in an accountant-cluster were either treated, or control. This leaves us with a sample size of 14,547 where cluster size has an average of 12.9, and a median of 9. While assignment is still random in this subpopulation, we leave out a non-random part of the original trial. This results in a lower share of treated population, especially in small clusters (Figure 4). We will run additional robustness checks to confirm the validity of inference in the network analysis.

Our approach will only cover network effects where the taxpayers and accountants have a more formalized arrangement. Anecdotal evidence suggests that in many cases accountants directly handle the taxpayers e-government accounts without registering as a representative⁶ and therefore see all of their correspondence with the tax administration.

⁶Registering as an official representative incurs some administrative cost. It can also make the representative legally liable for taxpayers behaviour, which accountants might want to avoid.

A Appendix

A.1 Letters

Katásként is gondoljon a nyugdíjas évekre!

Tisztelt <dr. Hosszúnevűné dr. Méghosszabb-Kötőjeles Gyöngyvírág Szemirámisz>!

Fontolja meg a magasabb összegű tételes adó fizetését, mert azzal hosszabb szolgálati időt és magasabb összegű nyugdíjat biztosíthat magának!

Mit jelent a magasabb összegű kata?

	Kata	Magasabb összegű kata
Havi tételes adó	50 000 Ft	75 000 Ft
Tb-ellátások alapja	94 400 Ft	158 400 Ft
Nyugdíjba számító szolgálati idő egy év alatt	236 nap	365 nap

Az ellátási alap azt a jövedelmet jelenti, amely az adott hónapban figyelembe vehető a TB ellátások – például táppénz, CSED, GYED, nyugdíj –, valamint az álláskeresői járadék számításakor. A hosszabb szolgálati idő is magasabb összegű nyugdíjat jelent.

Hogyan választhatja a magasabb összegű katát?

Töltse le a NAV honlapjáról a

» T19-XXX »

jelű nyomtatványt! Az adatlapot bármikor beadhatja, és a benyújtást követő hónaptól kell a magasabb összegű adót fizetnie.

További tájékoztatásért nyugdíjügyekben forduljon a Magyar Államkincstárhoz!

» Olvassa el a katás tájékoztatót, vagy Ügyfélszolgálatunk belépve » indíthat nyugdíjbiztosítási adategyeztetést. Az adategyeztetésről a » Kincstár honlapján talál további tájékoztatást.

Iktatószám: <Iktatószám>

Üdvözléssel:
Nemzeti Adó- és Vámhivatal

A NAV csak hivatalos csatornákon, Ügyfélszolgálaton, vagy postai úton kommunikál az adózókkal. Soha nem kérünk bankszámlára, vagy bankkártyára vonatkozó bizalmas adatot. Ügyeljen az adathalászokra, ellenőrizze, milyen internetes címre kattint!

(a) Generic, emphasising gains



Katásként is gondoljon a nyugdíjas évekre!

Tisztelt <dr. Hosszúnevűné dr. Méghosszabb-Kötőjeles Gyöngyvírág Szemirámisz>!

Katásként egy év alatt 12 hónap helyett csak 7 havi szolgálati időt szerez. Fontolja meg a magasabb összegű tételes adó fizetését, hogy ne veszítsen a nyugdíjából!

Mit jelent a magasabb összegű kata?

	Kata	Magasabb összegű kata
Havi tételes adó	50 000 Ft	75 000 Ft
Tb-ellátások alapja	94 400 Ft	158 400 Ft
Nyugdíjba számító szolgálati idő egy év alatt	236 nap	365 nap

Ön katás egyéni vállalkozóként az öregségi nyugdíjkorhatárig (65 év) hátralévő <A> év alatt szolgálati időt szerezne, ha továbbra is 50 ezer Ft tételes adót fizet. Ha magasabb összegű katára váltana, <C> év szolgálati időt szerezhetne. A nyugdíjazásig folyamatosan fizetett emelt összegű kata egy tipikus <életkor> éves számára várhatóan <D> százalékkal magasabb összegű nyugdíjat jelentene ahhoz képest, ha nem váltana emelt összegű katára.

Ez csak egy hozzávetőleges becslés, a jelenleg hatályos szabályok alapján, a » Magyar Államkincstár online nyugdíjalkulátora segítségével pontosabb számításokhoz. A tényleges különbség az Ön korábbi és jövőbeni életstílusától is függ. Az ellátási alap azt a jövedelmet jelenti, amely az adott hónapban figyelembe vehető a TB ellátások – például táppénz, CSED, GYED, nyugdíj –, valamint az álláskeresői járadék számításakor. A hosszabb szolgálati idő is magasabb összegű nyugdíjat jelent.

Hogyan választhatja a magasabb összegű katát?

A Töltse le a NAV honlapjáról a

» T19-XXX »

jelű nyomtatványt! Az adatlapot bármikor beadhatja, és a benyújtást követő hónaptól kell a magasabb összegű adót fizetnie.

További tájékoztatásért nyugdíjügyekben forduljon a Magyar Államkincstárhoz!

» Olvassa el a katás tájékoztatót, vagy Ügyfélszolgálatunk belépve » kérhet nyugdíjbiztosítási adategyeztetést. Az adategyeztetésről a » Kincstár honlapján talál további tájékoztatást.

Iktatószám: <Iktatószám>

Üdvözléssel:
Nemzeti Adó- és Vámhivatal

A NAV csak hivatalos csatornákon, Ügyfélszolgálaton, vagy postai úton kommunikál az adózókkal. Soha nem kérünk bankszámlára, vagy bankkártyára vonatkozó bizalmas adatot. Ügyeljen az adathalászokra, ellenőrizze, milyen internetes címre kattint!

(b) Personalized, emphasising losses (note the files in below the table of the main box)

Figure 5: Sample letters