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ORIGINAL PAPER
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THE EFFECT OF VAT REDUCTIONS ON NEWLY BUILT PROPERTIES AND CONSTRUCTIONS IN HUNGARY

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ABSTRACT

Motives: This study was undertaken to determine the feasibility and macroeconomic impact of reduced VAT. As an EU Member State, Hungary may apply reduced tax rates in accordance with the Council Directive 112/2006/EC. In Hungary, due to the high general tax rate, the range of products and services with reduced tax rates plays a special role.
Aim: In Hungary, a preferential VAT regime was introduced to reduce the increase in the price of new-build properties. The aim of this study was to examine whether reduced VAT had the desired effect. Therefore, the effect of 5% VAT on the Hungarian real estate price index was analysed based on the data provided by the Hungarian National Bank with the use of various statistical methods.
Results: The study demonstrated that a reduced VAT rate on newly built properties that meet certain conditions in Hungary had an impact on the real estate market. The date of the building permit, which is a prerequisite for applying a reduced tax rate, increased real estate prices as an immediate effect, which was reduced somewhat by the final consumer price due to the reduced tax rate. This double effect stabilised the real estate market price index.

Keywords: fiscal policy, real estate market, reduced tax rate

INTRODUCTION

The Value Added Tax (VAT) is widely used type of a sales tax. It is levied on the prices of products and services in all stages of production, distribution, and sale to the final consumer. The VAT has common characteristics, but considerable differences can be observed in VAT systems around the world. The main difference is the tax rate applied in every country. Standard tax rates are generally applied, and most countries also use reduced rates and exemptions. There are no common rules concerning tax rates, and the European Union (EU) is the only exception in this regard. Tax rates are set individually by the Member States, and the EU has only limited competences. The EU has common rules on VAT, but these provisions are part of a well-regulated framework. The above implies that the EU countries may apply different tax rates and reliefs. At present, tax rates are regulated by the Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax, which has been amended several times.

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According to this directive, Member States can apply a standard VAT rate and one or two reduced rates.

One of the goals of Hungarian economic policy is to provide greater support for families. Therefore, upon the EU's consent, a reduced tax rate of 5% was applied to the construction and sale of newly built properties on 1 January 2016. The reduced VAT rate is expected to decrease market prices and an increase macroeconomic demand. The present study was undertaken to analyse the real effects of the reduced VAT rate in Hungary and to examine whether this measure had the desired effect. The research hypothesis postulates that the reduced VAT rate has a delayed impact on the Hungarian property market.

LITERATURE REVIEW

Taxes constitute the competence of the Member States, and the EU has only limited competence in this regard. The main goal of the Treaty on the Functioning the European Union was to harmonise national legislation to ensure the establishment and the functioning of the internal market and to avoid distortion of competition (Treaty on the Functioning of the European Union (TFEU), 1958). There cannot be any obstacles to free competition in a harmonised internal market. Domestic markets cannot be protected against imports from EU markets that apply different tax rates. Double taxation should also be avoided within the EU. Therefore, the EU has common rules on VAT, but these regulations are only a part of legislative framework. Therefore, the VAT system is harmonised in the EU and does not differ in general, but Member States may apply the rules differently, which implies that tax rates and reliefs can differ across countries. The EU laws apply to VAT and tax harmonisation in all Member States.

At the EU level, VAT is regulated by the Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax, which has been amended several times. This study focuses on the impact of reduced VAT rates, and VAT rates in different EU countries will be examined. According to Directive 2006/112/EC, the Member States can apply a standard VAT rate and one or two reduced rates. However, special rates can also be applied, which further complicates the situation. The VAT rates in the EU countries are presented in Table 1.

The EU has a standard VAT rate of 15%, and reduced rates can be applied to specific goods. Special rates can be levied on products outside this list and only in certain countries. The goods and services that are subject to reduced rates include basic life necessities such as food, water, pharmaceutical products, medical equipment, books, newspapers, tickets to theatres, concerts, museums, and sporting events, radio and television broadcasting services, housing, funeral services, healthcare and dental care, municipal cleaning, refuse collection, and waste treatment. The present study focuses on the provision, construction, renovation, and alteration of housing as part of social policy (2006/112/EC regulation, 2006).

It should be noted that Hungary has the highest standard VAT rate not only in the EU, but also in the world. Standard VAT rates in the EU countries are presented in Figure 1.

What are the implications of the VAT burden from the consumers' point of view? As demonstrated in the below map (Fig. 2), the VAT burden of European households ranges from 14.7% (Hungary) to 6% (Luxemburg).

Table 1. VAT rates in the EU

Categories	Standard rate	Reduced rate	Special rates		
			Super-reduced rates	Zero rate	Parking rate
Measure	min. 15%	min. 5%	less than 5%	0%	min. 12%
Products	the supply of most goods and services	specific goods and services	limited products in certain countries	there is no product with zero rate	goods and services that aren't included into the reduced rate

Source: own preparation based on (Official Journal of the European Union, 2006).

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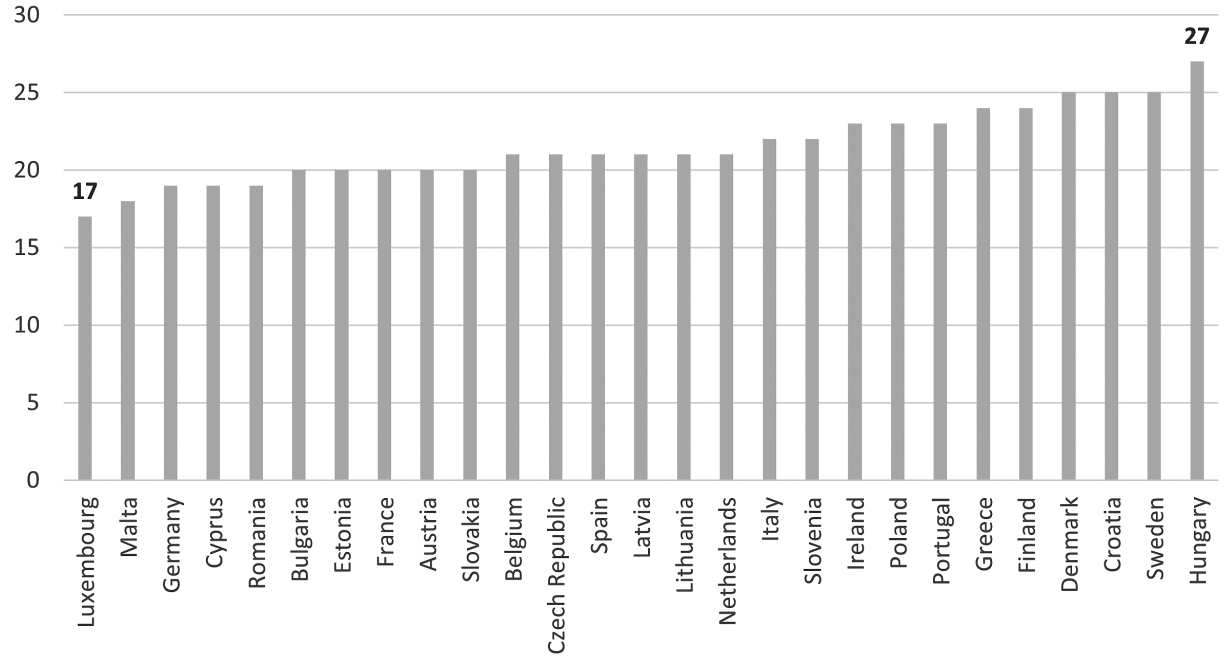

Fig. 1. Standard VAT rates in the EU countries (%)
Source: own elaboration based on European Commission data (European Commission, 2021).

The current study focuses on reduced VAT rates in social housing. This product category has been included in Annex III to the VAT Directive, which means that all EU countries can apply VAT rates of minimum 5% in the social housing sector. Reduced VAT rates are not applied in Bulgaria, Denmark, Germany, Estonia, Greece, Croatia, Latvia, Lithuania, Austria, Slovakia, Finland, and Sweden. In these countries, the standard VAT rate is between 19% and 25%. The remaining countries apply one or two reduced rates in the social housing sector. Reduced VAT rates in the EU are presented in Figure 3 (European Commission, 2021).

In Hungary, VAT is regulated by the Hungarian Value Added Tax Act (Hungarian Value Added Tax Act, 2007) (hereinafter referred to as the VAT Act) which is consistent with the EU Council Directive 112/2006. The directive allows the Member States to apply reverse taxation and reduced tax rates, and in Hungary, these measures have been applied several times in recent years. The purpose of reverse taxation is to decrease the risk of budgetary tax fraud, and in Hungary, a reverse charge mechanism applies to construction services, agricultural products, and metal sales. The construction industry requires special attention because real estate construction typically involves more subcontractors; therefore, reverse taxation can decrease costs for private buyers (who use construction services / buy property). Before reverse charge was applied to the construction sector, the range of semi-finished property was typical, and subcontracting services were risky. Reverse taxation has thus led to greater transparency on the construction market and reduced tax evasion.

Thus, the B2B market has been stabilised, but to encourage new investments and generate economic growth, the demand for investments should also increase in the private sector. In addition, one of the goals of Hungarian economic policy is to provide greater support for families, including family housing allowance (FHA). The main goal of the housing allowance system is to enable families with young children to obtain loans on preferential terms. However, new tax policy instruments have been

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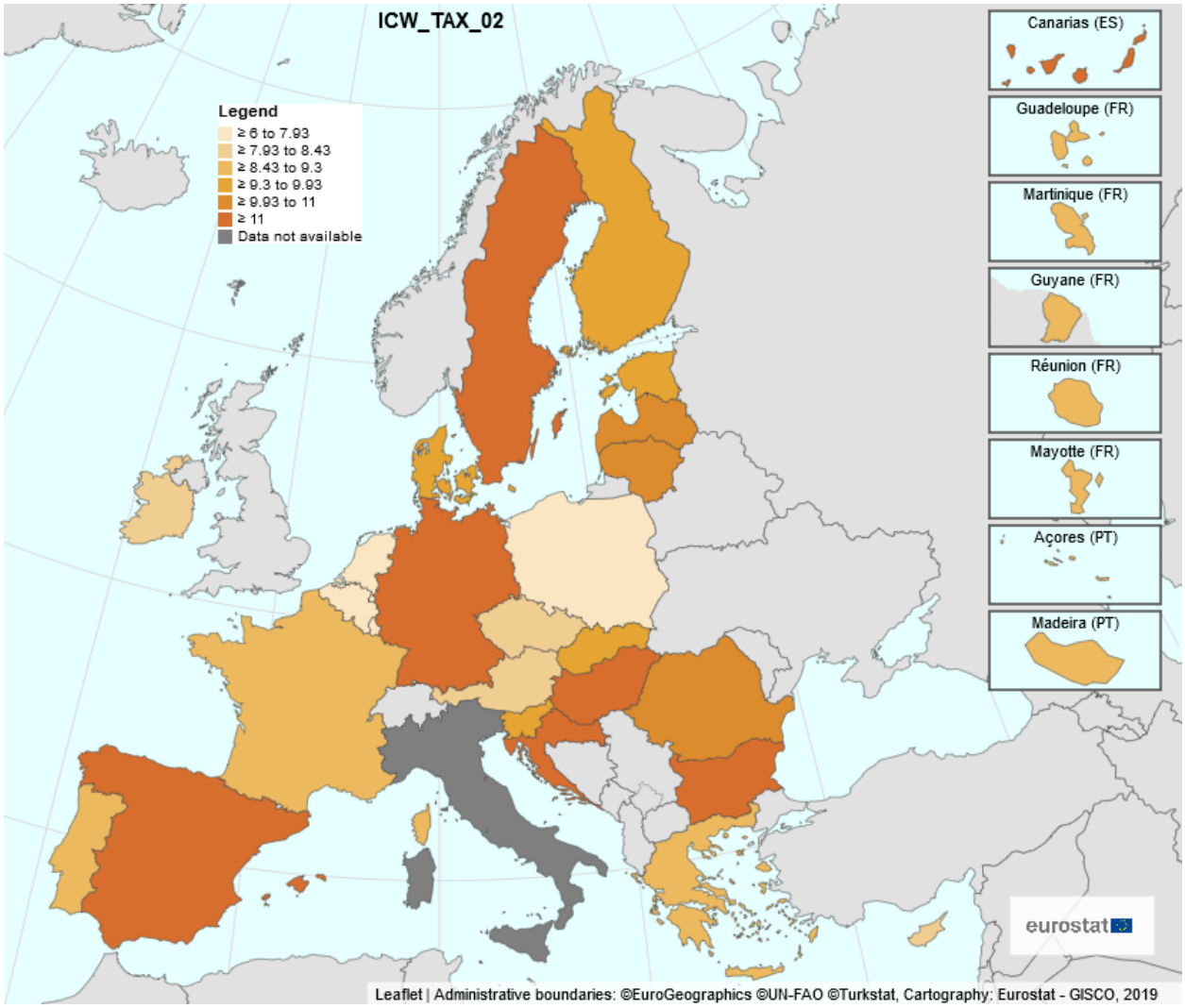

Fig. 2. Distribution of VAT paid by households as a percentage of their gross income by household type (2015)
Source: own elaboration based on Eurostat data (Eurostat, 2021).

introduced, and upon the EU's consent, a reduced tax rate of 5% was applied to the construction and sale of newly built properties on 1 January 2016. Prior to 2015, the increase in real estate prices was kept in check by lower taxes on newly built real estate, as shown in Figure 4.

The value of the property usually differs from its market price. Kobylińska and Źróbek analysed market data for 2010–2013 and found that property can be overpriced by 21.5% on average (Kobylińska & Źróbek, 2016).

It should be noted that a reduced tax rate can be only applied under certain conditions. In many cases, similar restrictions have been introduced to VAT laws applicable to real estate in other EU countries. The tax rates for newly built properties in the EU countries are presented in Figure 5.

As previously mentioned, reduced tax rates are applied at the discretion of each Member State; therefore, only several examples will be discussed for the needs of this study. In France, in addition to residential real estate, construction sites are also

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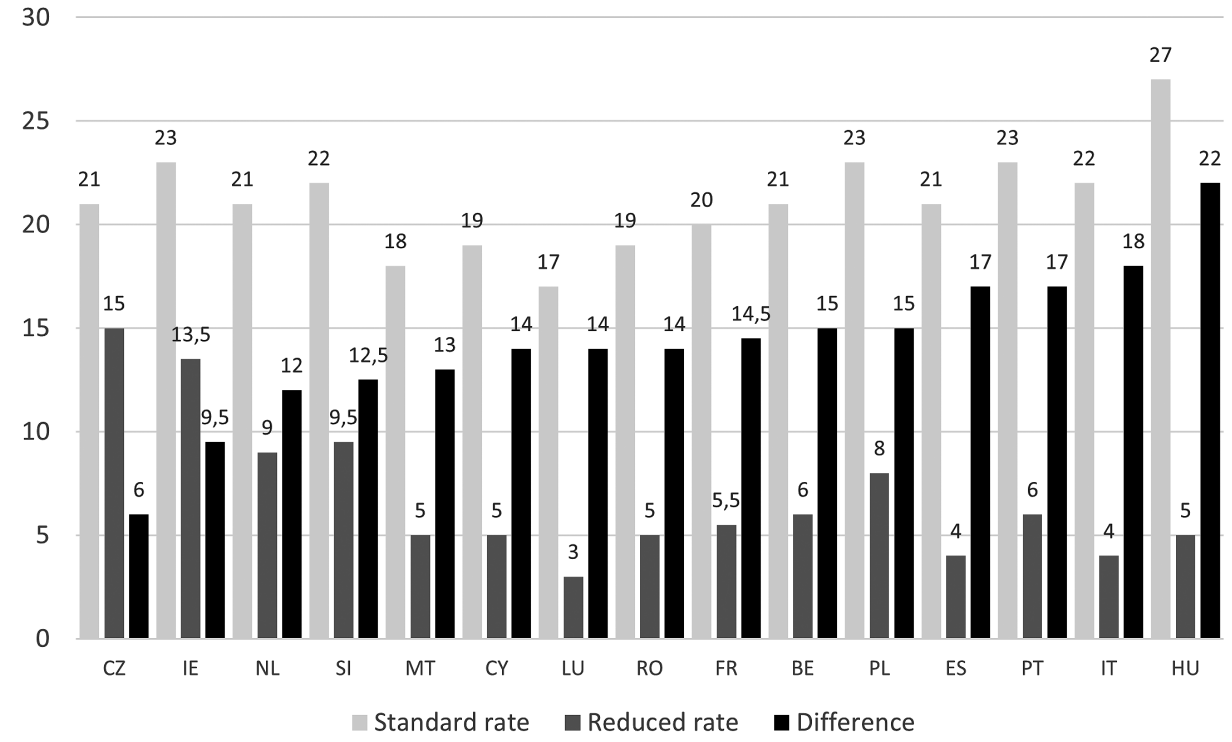

Fig. 3. Differences between standard and reduced VAT rates for social housing in the EU countries (% points)
Source: own elaboration based on European Commission data (European Commission, 2021).

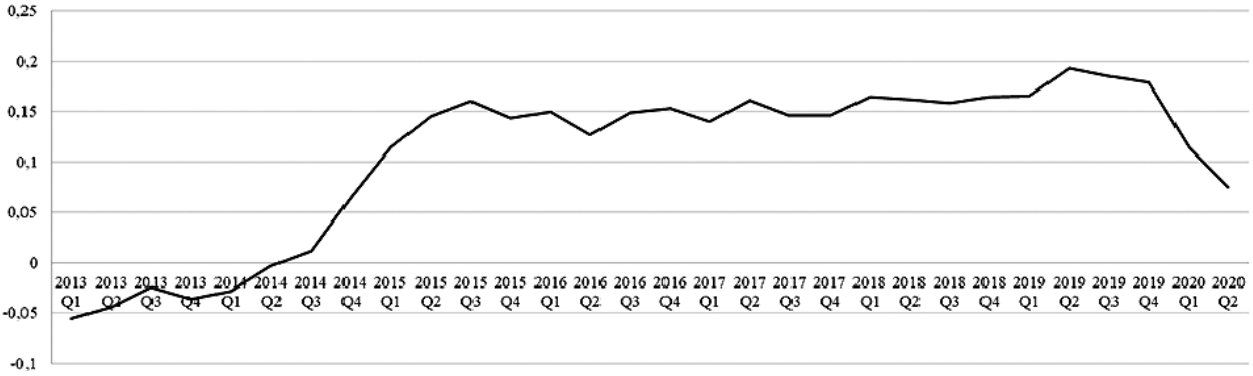

Fig. 4. Nominal real estate price index quoted by the Hungarian National Bank
Source: own elaboration based on Hungarian National Bank data (Central Bank of Hungary, 2020).

subject to a reduced tax rate. In Belgium, a reduced tax rate is applied to the conversion and rental of real estate. In Portugal and Italy, a reduced tax rate ("non-luxury housing"; "social housing with controlled costs") is linked with the household budget, whereas in Eastern European countries, a reduced rate may be applied only to property whose area does not exceed the prescribed limit. In Hungary and Poland, the reduced tax rate can be applied to apartments with a maximum floor area of 150 m^2 and residential buildings with a maximum floor area of 300 m^2.

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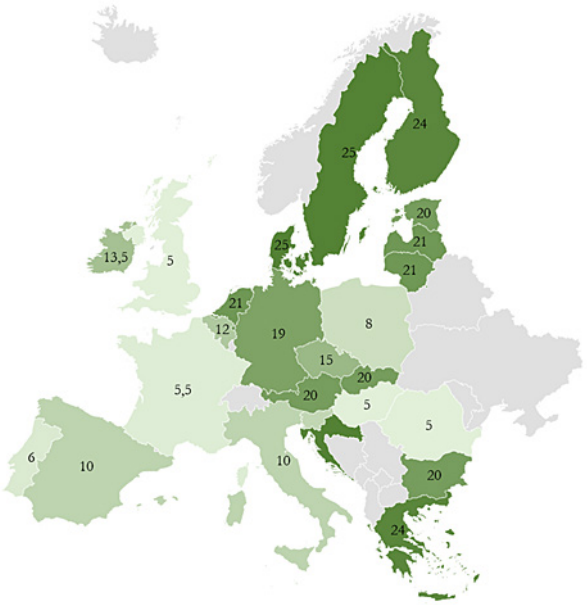

Fig. 5. VAT rates (%) for newly built properties in the EU Member States

Source: own elaboration based on European Commission data (European Commission, 2021).

According to the government, reduced VAT should decrease market prices and increase macroeconomic demand. However, in addition to the price effect, substitution and income effects also appear on the consumer side; therefore, the price effect is very difficult to measure. Barrel & Weale (2009) found that a 2.5 percentage point (pp) reduction in VAT increased consumption by 1% and GDP by 0.5%, but no long-term effect of the VAT reduction was observed (Barrell & Weale, 2009). In turn, Bernal observed that a 2 pp decrease in the VAT rate did not lead to a significant decrease in food prices in Poland (Bernal, 2018).

In 2006, Gabriel and Reiff relied on Hungarian data to determine the extent to which VAT effects are reflected in product prices, and they concluded that a VAT reduction did not decrease prices, but a VAT increase led to an increase in prices (Gábriel & Reiff, 2006). Manente & Zanette examined the impact of a reduced VAT rate in the Italian tourism sector and found that a VAT reduction from 10% to 5% led to a 4.4% increase in demand (Manente & Zanette, 2010). In 2010, the VAT rate on restaurant meals was reduced from 22% to 13% in Finland and from 25% to 12% in Sweden. However, these changes did not lead to a decrease in prices or an increase in demand (Harju & Kosonen, 2013). Thus, in the light of international experiences, the aim of this study was to determine whether housing investment trends developed differently in the period before and after the application of a reduced VAT rate and to determine the impact of a reduced VAT rate on the number of issued building permits and new-build properties. The analysis was based on real estate market data covering the period between 2Q2003 and 2020 (Central Bank of Hungary, 2020). Data were analysed by comparing two independent samples and by examining time series.

MATERIALS AND METHODS

In the first stage of the study, the demand for new-build housing was analysed before and after the introduction of a reduced VAT rate. The reduced VAT rate on real estate was adopted as a dummy variable; therefore, the data in the period between 4Q2013 and 2015 were labelled as 0, and the data in the period 1Q2016 and 2Q2020 were labelled as 1. These values denote the absence or presence of a reduced tax rate on real estate in 2013–2015. The two periods contain independent variables and can therefore be considered as two independent groups for statistical analysis. The two groups of data (before and after the application of a reduced VAT rate) were processed in the Mann-Whitney test to determine the number of issued building permits and then new properties. Outliers were handled by logarithmization (Ramanathan, 2003) by log transforming the number of issued permits and the number of new properties.

The time horizon for issuing a building permit was examined in the following step of the analysis. The length of delays that affected the number of building permits on the real estate market was examined with the use of a vector autoregression (VAR) model. Based on the literature, a 4-quarter delay was adopted in the model. The administration and

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implementation of real estate development projects is a lengthy process. In Poland, the real estate division process lasts more than 6 months (Bieda et al., 2016).

RESULTS

The effect of a reduced VAT rate on demand for new-build housing

The analysis of building permits revealed that data did not follow a normal distribution (Shapiro--Wilk test 0.013%); therefore, the medians of two independent samples were compared in the Mann-Whitney test. The median values of the number of building permits differed significantly between two periods, as demonstrated by the boxplots in Figure 6.

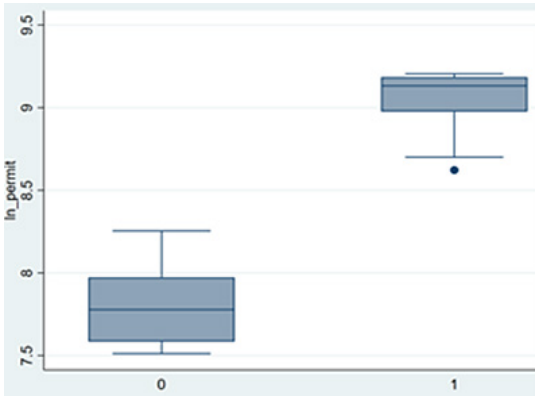

Fig. 6. Boxplot of the number of permits
Source: STATA output.

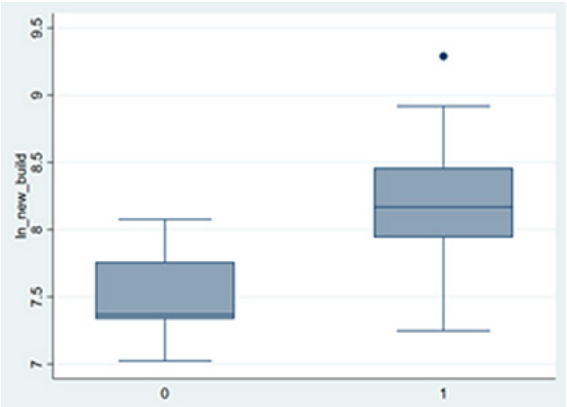

Fig. 7. Boxplot of the number of new buildings
Source: STATA output.

Based on the assumption that the number of newly built properties was normally distributed (Shapiro--Wilk 15.472%), data were analysed in the t-test for independent samples which revealed a significant difference between the average values, as illustrated by boxplots in Figure 7.

The effect of a reduced tax rate in different time periods

The STATA output in Figure 8 indicates that the number of issued building permits influenced the number of new construction properties with a delay of 3 and 4 quarters. This is not surprising because this period corresponds to the length of a typical construction project.

Based on the above, it can be concluded that a clear relationship exists between the number of issued building permits and the number of new-build properties after 3 and 4 quarters. Therefore, the influence of the number of newly built properties on property prices was examined in the last step of the analysis.

The effect of a reduced tax rate on the property price index

During the VAR analysis, no time series effect was observed between the number of newly built properties and the property price index; therefore, a regression model was used to examine the relationship between the two variables, and the statistical output is shown in Figure 9.

The results of the regression model indicate that the number of issued building permits increased ($p = 0.000$) and that a 5% real estate tax decreased the real estate price index.

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```
. var d_ln_new_build d_ln_permit, lags(1/4) exog(t)

Vector autoregression

Sample:  1961q3 - 1964q4                        Number of obs     =         14
Log likelihood =   41.76842                     AIC               =  -3.109775
FPE            =   .0003162                     HQIC              =  -3.194284
Det(Sigma_ml)  =   8.78e-06                     SBIC              =  -2.196836

Equation           Parms      RMSE     R-sq      chi2     P>chi2
d_ln_new_build        10   .184583   0.9666   404.6647   0.0000
d_ln_permit           10   .108646   0.7821   50.25895   0.0000

                    Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
d_ln_new_build
d_ln_new_build
          L1.   -.551261   .2409026    -2.29   0.022    -1.023421   -.0791006
          L2.   -.5866308   .2228841    -2.63   0.008    -1.023476    -.149786
          L3.   -.6145765   .2439079    -2.52   0.012    -1.092627   -.1365257
          L4.    .2488178   .2509036     0.99   0.321    -.2429441    .7405798

   d_ln_permit
          L1.   -.0706884   .3384501    -0.21   0.835    -.7340385    .5926617
          L2.   -.4466089   .3535837    -1.26   0.207     -1.13962    .2464024
          L3.    .8556893   .3943614     2.17   0.030     .0827553    1.628623
          L4.    .7342376   .2631085     2.79   0.005     .2185544    1.249921

           t    -.003561   .0153008    -0.23   0.816    -.0335499    .0264279
       _cons    .1577954   .2287469     0.69   0.490    -.2905402     .606131
```

Fig. 8. Results of the VAR model
Source: STATA output.

```
. regress hp_index tax5 ln_permit ln_new_build

      Source |       SS       df       MS              Number of obs   =        30
-------------+------------------------------           F(3, 26)        =     33.74
       Model |  .145602753     3  .048534251           Prob > F        =    0.0000
    Residual |  .037402461    26  .001438556           R-squared       =    0.7956
-------------+------------------------------           Adj R-squared   =    0.7720
       Total |  .183005213    29  .006310525           Root MSE        =    .03793

------------------------------------------------------------------------------
    hp_index |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       tax5 |  -.1468783   .0461628    -3.18   0.004    -.2417673   -.0519893
  ln_permit |     .21172   .0360765     5.87   0.000     .1375636    .2858763
ln_new_build|  -.0057995    .016366    -0.35   0.726    -.0394403    .0278412
      _cons |  -1.570162   .2797365    -5.61   0.000    -2.145168   -.9951549
------------------------------------------------------------------------------
```

Fig. 9. Results of the regression model
Source: STATA output.

CONCLUSIONS

The main aim of this study was to analyse the applicability of a reduced VAT and its macroeconomic impact. As an EU Member State, Hungary may apply reduced tax rates in accordance with the EU Council Directive 112/2006. Due to a high general tax rate, the range of products and services that fall subject to reduced tax rates in Hungary plays a key role. Therefore, the effect of 5% VAT on the Hungarian real estate price index was analysed based on the data provided by the Hungarian National Bank with the use of various statistical methods. In the first step, the number of building permits and the number of newly built properties was compared before and after the introduction of a reduced VAT rate, and the analysis revealed

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that both indicators were significantly higher after a reduced VAT rate had been introduced. Before 2021, the application of a reduced tax rate for new construction properties was tied to the date of the issued building permit. Therefore, the study examined the time period after which the number of issued building permits (as a precondition for applying the reduced tax rate) affected the number of new construction properties. The VAR model demonstrated that supply on the real estate market increased with a delay of 3 and 4 quarters, which corresponds to the length of a typical construction project.

Real estate prices can ultimately be measured with the real estate price index; however, a delay was not observed between the number of newly built properties, the number of issued building permits, the introduction of a 5% tax rate, and the price index, which implies that a simultaneous effect exists between the indicators. The regression model supported this assumption, and it revealed that the number of issued building permits increased and that 5% VAT decreased the property price index. These results are consistent with the economic revitalization effect observed by Barrel & Weale and Manente & Zanette in the Italian tourism sector.

Overall, the study demonstrated that a reduced VAT rate that can be applied to newly built properties in Hungary under certain conditions had an impact on the real estate market. The date of the building permit, which is a prerequisite for applying the reduced tax rate, increased real estate prices as an immediate effect, but it was somewhat reduced by the final consumer price due to the reduced tax rate. In view of the substitution effect in microeconomics, prices were not expected to decrease by 22 percent. This double effect stabilised the real estate market price index.

The results of this study can be used by other EU Member States which have considerable freedom in applying reduced VAT rates on products and services. The delay effect in other areas could be investigated using the presented method. For example, a reduced VAT rate on accommodation services would not lead to an immediate increase in the number of bookings because users make reservations months in advance. The applicability of a reduced VAT rate can be considered in a specific economic context, and the delay effect can be incorporated into the model by analysing the impact of reduced VAT.

Author contributions: The authors have approved the final version of the article. The authors have contributed to this work as follows: D.K.G. conducted the literature review and collected international data. R.K.P. developed the concept and analysed and interpreted the data. Both authors prepared the draft manuscript. D.K.G. edited the manuscript.

Supplementary information: not relevant.

Note: The results of this study have not been presented in a different form, such as a poster/abstract at a conference.

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