



The effect of card payments on VAT revenue: New evidence from Greece[☆]



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HIGHLIGHTS

- A 1pp increase in the share of card payments in private consumption results in approximately 1% higher VAT revenue through increased compliance.
- Lowering the VAT rate can generate revenue gains.
- Card transactions may facilitate tax buoyancy.

ARTICLE INFO

Article history:

Received 30 March 2017

Received in revised form 8 May 2017

Accepted 10 May 2017

Available online 24 May 2017

JEL classification:

H21

H25

H26

Keywords:

VAT

Card payments

Time-varying coefficients

Greece

ABSTRACT

The anticipated positive effect of card payments on VAT revenue performance has eluded empirical confirmation. The case of Greece provides a unique study ground, as the imposition of restrictions on cash withdrawals in July 2015 triggered a surge in card payments and in VAT revenue. Applying time-varying coefficient methods to Greek data during 2003q4–2016q2 we find that (i) a 1pp increase in the share of card payments in private consumption results in approximately 1% higher revenue through increased compliance; (ii) lowering the VAT rate can generate revenue gains; (iii) card transactions may facilitate tax buoyancy.

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1. Introduction

To the extent that tax evasion is facilitated by cash transactions, card payments are likely to increase the perceived probability of detection, leading to greater tax compliance. Rogoff (2014) argues that in most countries well over 50% of currency is used to hide transactions. While a positive relation between card payments and economic activity has been reported in Hasan et al. (2012) and in Zandi et al. (2013), evidence on the effect of card payments on VAT revenue performance is scarce. Madzharova (2014) is, to the best of our knowledge, the only empirical study investigating the effect of card transactions on VAT revenue efficiency. Using

annual observations in a panel of 26 EU countries during 2000–2010 she reports evidence that cash transactions impede revenue performance, although, card payments are not found to have a significantly positive influence.

This paper revisits the effect of card payments on VAT revenue performance, using quarterly observations on card transactions in Greece during 2003q4–2016q2. The case of Greece provides a unique study ground, as the imposition of restrictions on cash withdrawals in July 2015 triggered a surge in card payments, followed by an unprecedented pick up in VAT revenue (Fig. 1). We study the recent episode of rising card payments using time-varying coefficient methods (TVC) along the lines of Hall et al. (2013), which to the best of our knowledge is the first application in this area of research. The main findings are that (a) a 1pp increase in the share of card payments in private consumption results in approximately 1% higher VAT revenue through increased compliance, (b) lowering the VAT rate can generate revenue gains and (c) card transactions may facilitate tax buoyancy.

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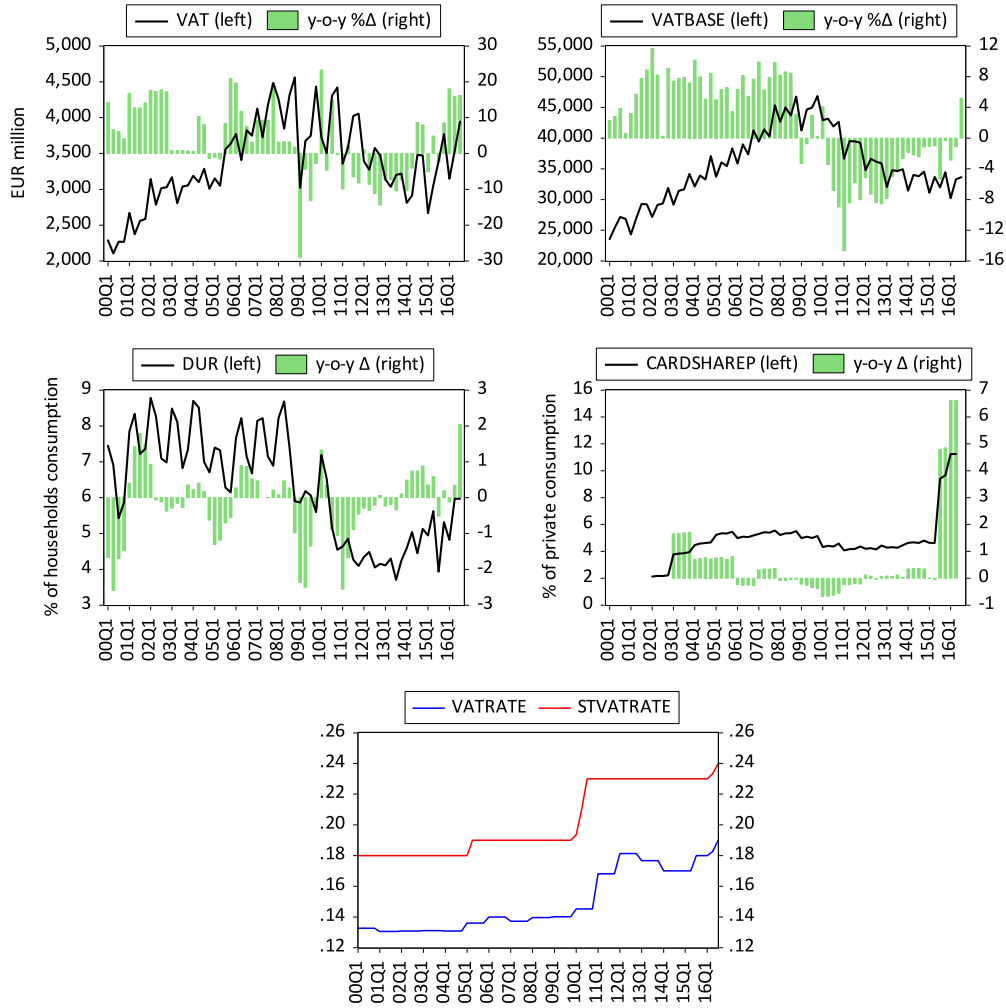


Fig. 1. Data overview 2000q1–2016q3. VAT = general government VAT revenue, VATBASE = (nominal private consumption) + (general government intermediate consumption), CARDSHAREP = (expenditure by cards issued by resident PSPs)/(nominal private consumption), DUR = (nominal household consumption on durables)/(nominal final consumption of households), VATRATE = average VAT rate, STVATRATE = standard VAT rate. Source: National Accounts (ESA 2010); Bank of Greece data on card payments, Ministry of Finance estimate of VATRATE.

Section 2 describes the empirical specification, Section 3 discusses our baseline results, Section 4 reports a series of robustness checks and Section 5 concludes.

2. Empirical specification

We model the yearly growth rate of VAT revenue using quarterly observations according to the following TVC model:

$$\Delta^4 \ln(VAT_t) = b_{0,t} + b_{1,t} \Delta^4 \ln(VATRATE_t) + b_{2,t} \Delta^4 \ln(VATBASE_t) \quad (1)$$

where Δ^4 denotes year-on-year difference (i.e. $\Delta^4 x_t = x_t - x_{t-4}$), VAT_t is VAT revenue, $VATRATE_t$ is the average VAT rate and $VATBASE_t$ is the post-tax measure of the tax base, measured by the sum of nominal private consumption and general government intermediate consumption. The time-varying coefficients $b_{1,t}$ and $b_{2,t}$ are elasticities of revenue with respect to the tax rate and the tax base, respectively. Effects other than the tax base and the tax rate are captured by $b_{0,t}$, which may thus be interpreted as a proxy for tax compliance. We estimate $b_{i,t}$, $i = 0, 1, 2$ as functions of the share of card payments in private consumption, $CARDSHAREP_t$ and of the share of durable goods in households' consumption, DUR_t .

The general specification is given by:

$$b_{i,t} = c_{i0} + c_{i1} b_{i,t-1} + \mathbf{W}(L) \mathbf{x}_t + e_{it} \quad (2)$$

where $\mathbf{x}_t = [\ln(DUR_t), \Delta^4 \ln(DUR_t), \ln(CARDSHAREP_t), \Delta^4 \ln(CARDSHAREP_t)]$, $\mathbf{W}(L) = w_{i0} + w_{i1}L + w_{i2}L^2 + \dots + w_{ip}L^p$, with w_{ij} being $1 \times n$ vectors, c_{i0} , c_{i1} and the elements of w_{ij} are estimated constant parameters. The residuals e_{it} are normally distributed with variance $\sigma_{i,t}$ which is allowed to permanently shift in 2010q2, marking the adoption of the first economic adjustment programme.

$$e_{i,t} \sim N(0, \sigma_{i,t}^2), \quad \sigma_{i,t} = \begin{cases} \sigma_{i,1}, & t < 2010q2 \\ \sigma_{i,2}, & t \geq 2010q2. \end{cases}$$

Based on the discussion above, we anticipate tax compliance, captured by $b_{0,t}$, to increase after 2015q3 and to be a positive function of $CARDSHAREP_t$. The revenue elasticity with respect to the tax base, $b_{2,t}$, can be expected to be positively related to the share of durable goods in households' consumption, as durables tend to be taxed at higher rates. We have no clear priors regarding the effects of $CARDSHAREP_t$ and DUR_t on the revenue elasticity with respect to the tax rate, $b_{1,t}$.

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