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Austerity and tax compliance☆

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ABSTRACT

Relying on a novel measure of VAT compliance in a panel of 35 countries, we document a robust negative response of tax compliance to changes in tax rates. In order to rationalize this finding, we develop a theoretical framework where heterogeneous firms adjust the share of declared activity. We calibrate the model using firm-level data in Greece, and find large leakages following the recent austerity plans. We then show how differences in financial development and the size of economic activity at the margin of informality are able to explain the heterogeneous response of tax compliance to tax rates across countries.

1. Introduction

Recent episodes of austerity in peripheral European countries have shown that the increase in tax revenues after a tax hike may be undermined by the strong response of tax compliance. While fluctuations in output due to tax hikes have been studied in the literature,[1] the aggregate implications of the response of tax compliance to such reforms have been overlooked. A decrease in tax compliance may not only reduce the impact of a fiscal adjustment, but also have collateral effect on firm decisions, e.g., through their access to external finance and investment.

In this paper, we provide evidence of a large and negative tax compliance response to fiscal consolidation episodes. We compile a catalogue of indirect tax reforms in 35 countries between 1990 and 2012, and construct a measure of Value-Added-Taxes (VAT) compliance based on the comparison between two distinct sources: reported household consumption

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[1] See for instance Alesina and Ardagna (2009), Romer and Romer (2010), Favero et al. (2011), Auerbach and Gorodnichenko (2012), Ilzetzki et al. (2013), and Alesina et al. (2015).

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collected through household surveys and tax revenues reflecting taxpayers' declarations.[2] We find a robust and sizeable negative association between changes in VAT compliance and changes in VAT rates. A VAT increase of 10% is associated with a decrease in VAT compliance of about 4%. Importantly, the elasticity of tax revenues to tax reforms is much smaller within the sample of countries with high legal enforcement.

In order to explain the quantitative response of tax compliance to tax reforms as well as its heterogeneity across institutional environments, we build a theoretical model with heterogeneous credit-constrained firms operating in a modern or a traditional sector. In the model, there is imperfect tax enforcement. *Transparency*, that is the share of declared activity, simultaneously determines access to external finance and tax pressure. A tax increase has two distinct effects on transparency. First, firms at the margin of informality do not find profitable anymore to be transparent and get access to external finance. As a consequence, they switch their activity from the modern (and transparent) sector to the traditional (and informal) sector. Second, medium-size firms still operate mainly in the modern sector but they declare less than before. At both ends of the firm size distribution, however, the response to tax increase does not pass through a transparency adjustment: very large firms remain fully transparent while very small firms remain fully informal.

We explore the quantitative implications of our model that can be measured against the initial stylized facts. We reproduce the fiscal adjustment program imposed on the Greek government by the "Troika" (EU-ECB-IMF) in 2010. We calibrate the model to match firm-level balance sheets data on 30,000 Greek firms provided by Hellastat. We find that the elasticity of tax revenues to tax hikes is about 0.5 as both transparency and output respond to the tax hikes. Three quarters come from the transparency component, against one quarter explained by the contraction in output. These estimates are consistent with the drop in VAT compliance and tax revenues observed after the fiscal consolidation in Greece.[3]

We then analyze how (i) fundamentals of the economy – tax enforcement, financial development and firm size distribution – and (ii) characteristics of tax policies affect the magnitude of the transparency response. In a first step, we run a series of counterfactual experiments and show that the aggregate transparency response to the baseline tax policy strongly depends on financial development and firm size distribution. Indeed, the differential response to the tax policy depends on the share of economic activity generated by firms at the margin of informality, which is a function of both fundamentals. For instance, Southern European countries are economies where the aggregate response of tax compliance to tax hikes is large, because tax enforcement is weak and firms at the margin of informality constitute a large share of the economy. In a second step, we modify the characteristics of the baseline tax reform to account for policy features observed in other peripheral European economies. We find that size-dependent tax reforms may be more effective than uniform tax hikes. The rationale for size-dependent tax policies in the model is that the elasticity of tax revenues to tax rates markedly depends on firm size, and is close to zero or even negative for very small firms.

The results highlighting the role of fundamentals for the response of tax compliance should be interpreted cautiously. The quantitative analysis relies on a static model in a closed economy with a mass of heterogeneous entrepreneurs, one production factor, one final good and an exogenous government. The supply of entrepreneurs and their endowments is fixed, and the main adjustment variable is transparency which governs both access to credit and tax pressure. As the firm size distribution is constant, the model does not provide insights about the long-term effects of taxation on the structure of production.[4] In addition, a proper welfare analysis would need to balance the immediate consumption costs of fiscal consolidation with possible gains in future consumption, and our model does not account for such gains.

Our contribution to the economic literature is twofold. First, we build a measure of tax compliance and study its dynamics, in particular its response to tax reforms. Second, we study the aggregate implications of the elasticity of tax compliance to tax reforms in a model with heterogeneous firms and credit frictions.

The empirical analysis of fluctuations in tax compliance relates to a public economics literature which analyzes tax evasion using micro-level data.[5] Our empirical approach exploits discrepancies between two reporting sources of income, as in Fisman and Wei (2004), Cai and Liu (2009) and Kleven et al. (2011) for instance. In contrast with this literature, we provide model-based estimates and study the implications of fluctuating tax compliance on aggregate variables.

The existence of a tax compliance response beyond the traditional behavioral response to tax rates is often ignored in the macroeconomic literature. A recent and notable exception is Pappa et al. (2015), which study the contribution of tax evasion and corruption to the size of the fiscal multiplier during the recent consolidation plans in Greece, Italy, Portugal and Spain. In line with our main findings, they show that tax hikes increase the incentives to conceal part of the activity and produce in the less productive informal sector, thus increasing output losses.

The paper speaks to a large and mostly theoretical literature examining the relationship between informal activity and financial development. Specifically, we relate to Gordon and Li (2009) in that the interaction of financial development and

[2] This measure of VAT compliance is constructed to be orthogonal to fluctuations in each 2-digit category of goods. In an economy where taxpayers declare entirely their transactions, the ratio of *actual* annual tax revenues to the *expected* VAT revenues would be equal to 1 independently of fluctuations in sectoral output.

[3] Following the 2010 tax reforms in Greece, VAT compliance decreased by about 7% while the VAT rate increased by about 20%, that amounts to an elasticity of VAT compliance to VAT rates of −0.35. An implication is that only half of the expected additional tax revenues was collected – 1.5 instead of 3.1 points of GDP – leading to further adjustments in 2011, 2012 and 2013.

[4] See Fortin et al. (1997) for a theoretical analysis of the effect of taxation on firm distribution, and Kumar et al. (1999) and Garicano et al. (2016) for an empirical investigation of the determinants of firm size.

[5] See Andreoni et al. (1998) and Slemrod and Yitzhaki (2002) for a review, and Pomeranz (2015) for an empirical investigation of VAT evasion and third-party reporting.