"Your IMF Working Paper is the first time I've seen a serious effort to look at the elasticity of taxable income with respect to tax rates. This is what I had written and talked about for some 35 years. You're the first and the paper is superb."

Arthur B. Laffer

Tax rate cuts and tax compliance - the Laffer curve revisited
Tamás K. Papp and Előd Takáts

Can tax rate cuts increase revenues? The question has been recurring in tax policy discussions from the United States to other developed and emerging economies. The Russian flat tax experiment is particularly interesting: after the introduction of flat taxes, and effective personal income tax rate cuts, tax revenues increased substantially and almost immediately. Furthermore, they increased much faster than labor supply and output. The paper explains how tax rate cuts can increase tax revenues through tax compliance spillovers in such a manner.

Tax compliance issues are widespread and are of general interest. Even in the United States, with its sophisticated tax enforcement mechanisms, the IRS (2006) estimated the federal tax gap to reach US$ 345 billion or 16.3% of total revenues in 2001. Tax gaps and compliance problems might be even more relevant in other countries. This paper identifies the theoretical conditions under which tax rate cuts can increase compliance sufficiently to increase tax revenues.

To illustrate the potential effects of tax rate cuts on tax revenues consider the example of Russia. Russia introduced a flat 13 percent personal income tax rate, replacing the three tiered, 12, 20 and 30 percent previous rates (as detailed in Ivanova, Keen and Klemm, 2005). The tax exempt income was also increased, further decreasing the tax burden. Considering social tax reforms enacted at the same time, tax rates were cut substantially for most taxpayers. However, personal income tax (PIT) revenues have increased significantly: 46 percent in nominal and 26 percent real terms during the next year. Even more interesting PIT revenues have increased from 2.4 percent to 2.9 percent of GDP --- a more than 20 percent increase relative to GDP. PIT revenues continued to increase to 3.3 percent during the next year, representing a further 14% gain relative to GDP. Furthermore, even official estimates showed increased tax compliance.[1]

This paper shows that endogenous tax compliance responses can be responsible for the massive increase in tax revenues. The key intuition is that tax regimes are prone to spillovers, as the aggregate behavior of taxpayers determines how much time the tax authority can dedicate to the individual taxpayer. In a way, tax evaders protect each other by tying down the tax authority's limited capacity. Hence, small cuts in the tax rates can lead to much larger changes in the behavior of taxpayers - most importantly, it can make them much more likely to declare their incomes honestly. These spillovers can lead to increasing tax revenues.

The paper builds a general equilibrium model with heterogeneous taxpayers with endogenous tax audit probabilities. The model is set up in three steps. First, we endogenize the probability of tax audits following Sah (1991) endogenous crime result. In the tax literature reviewed in Slemrod and Yitzhaki (2002) tax audit probabilities are taken exogenously. In our setup the tax authority has fixed time endowment to audit a unit volume of

[1] On one hand, those affected by the tax rate cuts (higher income taxpayers) improved their compliance, which is consistent with our model. On the other hand, Ivanova, Keen and Klemm (2005) also found that the unaffected had significant salary increases and the observed compliance increase does not explain revenue increase. However, in the light of this model, it would worth further studies to disentangle effects of higher wages from those of higher reported wages and higher compliance. Higher reported wages might be a consequence of unobserved increase in compliance. In any case, this model is not an empirical evaluation of what has happened in Russia, but a general theoretical exploration of tax rate cuts.

taxpayers. The fixed endowment incorporates the long term capacity building needs of increasing the tax authority's effective resources. Auditing honest taxpayers is less time consuming than auditing tax evaders, as there is no need for prosecution. Hence, the more taxpayers evade taxes, the less likely it is that the tax authority can audit individual taxpayers. In short, the tax authority's limited capacity combined with auditing time differences creates the externality.

Second, we endogenize labor supply decisions into the decision of the taxpayer. In order to obtain a closed form solution, a linear quadratic model setup is chosen. [2] Agents decide both about their labor supply and whether or not declare their income. Tax evaders who get caught pay due taxes and penalties proportional to the tax revenues evaded.[3]

In this setup, taxpayers evade less tax payments when the tax rate is lower, ceteris paribus. Intuitively, the gains from tax evasion drop faster than potential costs as the tax rate decreases. The result is supported by Clotfelter (1983) who finds empirically that evasion increases with the tax rate.

Third, we introduce heterogenous taxpayers, who differ in what we call shame, i.e. in their utility costs of punishment from public humiliation or prison sentences. [4] Sufficient taxpayer heterogeneity ensures that tax changes result in continuous changes in tax revenues. [5] Of course, "tax riots" (as in Bassetto and Phelan, 2006) can happen as responses to drastic measures, such as the British poll tax (see further in Besley et al, 1997). However, our focus is on the effects of minor changes in the tax rate through spillovers in compliance, without major changes in the perceived fairness of the tax regime.

The model demonstrates that even with relatively small labor supply responses tax rate cuts can increase equilibrium tax revenues significantly. The available data from the Russian flat tax experiment is consistent with the results detailed here. In spite of the tax rate cuts the average effective PIT rate has increased from 11.2 percent to 11.8 percent suggesting higher compliance. Even official estimates have shown an increase in compliance from 72.4 percent to 74.0 percent. The estimates of Ivanova, Keen and Klemm (2005) show an even larger compliance effect for the affected group. Contradicting the traditional labor supply based explanations of the Laffer effect, measures of labor supply remained mostly unchanged.

Placing the tax evasion problem in a simple general equilibrium framework is useful for understanding the macroeconomic consequences of tax policy. First, it allows the joint investigation of taxes and other macroeconomic issues. The implications are not trivial: for instance, under standard RBC parameters the income effect of taxes dominates, thus consumers increase labor supply as a response to increased taxes. This is clearly inconsistent with what we know about the effects of tax increases. Second, the joint setup allows future calibrations to separately analyze labor supply (i.e. classical supply side) and compliance related effects of tax cuts.

The model can be used to sharply distinguish tax compliance effects from labor supply ones when thinking about the effects of tax cuts on tax revenues. Classical empirical studies like Heckman (1983) or Feldstein (1995) abstracted away from the compliance channel and focused entirely on the labor supply. Even the more recent Feldstein (2002) and the Fisman and Wei (2004) studies do not distinguish between the two

[2] Risk neutrality implied by the model setup is not fully innocuous. As shown in Allingham and Sandmo (1972) risk averse consumers might in fact increase tax evasion under certain circumstances. Intuitively, lower taxes imply higher income, and thus higher propensity to gamble for risk averse consumers.

[3] The literature (reviewed in Slemrod and Yitzhaki, 2002) distinguishes between two types of penalties: those proportional to tax revenues evaded and those proportional to income concealed. We choose the former as it is the weakest assumption we need: behavioral changes are, if anything, stronger if tax cuts do not also cut the punishment for evasion. Hence, our results are only stronger under the other assumption. The correct specification, however, might be relevant for calibrating the model, and it should be subject to further research.

[4] The specifications leads to qualitatively equivalent results to the one under which costs of evasion differ.

[5] The homogenous taxpayer setup could potentially lead to multiple equilibria as in the reputational model of Cowell (1990).Even the heterogenous agent model can produce multiple equilibria, as it is shown in the appendix.

effects when discussing the existence of the Laffer curve in alternative settings.

Finally, the model can be used to think about tax rate cuts and their effects. Most importantly, the tax compliance channel explored here provides a non-ideological tax rate cut rationale: tax rate cuts increase revenues by increasing the effective tax rate. This increase comes only at the expense of tax evaders, i.e. those who previously did not comply with the tax regime - and is not costly for law-abiding taxpayers. In fact, law abiding taxpayers' tax burden decreases while tax revenues increase. As a result policy makers might use the additional proceedings to cut taxes further or increase government spending at their discretion.

Excerpts from the IMF Working Paper 08/07 available at

http://www.imf.org/external/pubs/ft/wp/2008/wp0807.pdf

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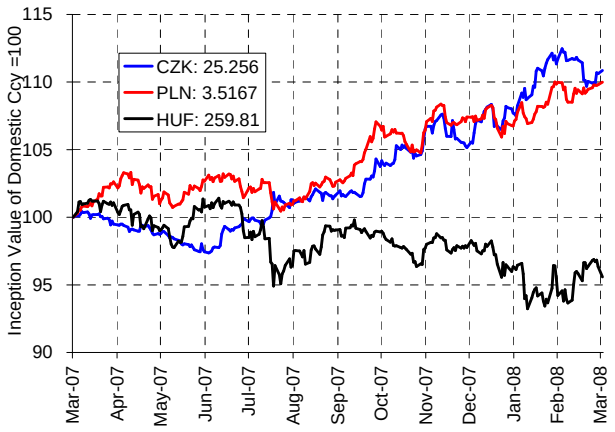
HunEx Econ — Markets at a Glance

March 31, 2008

Currency Markets

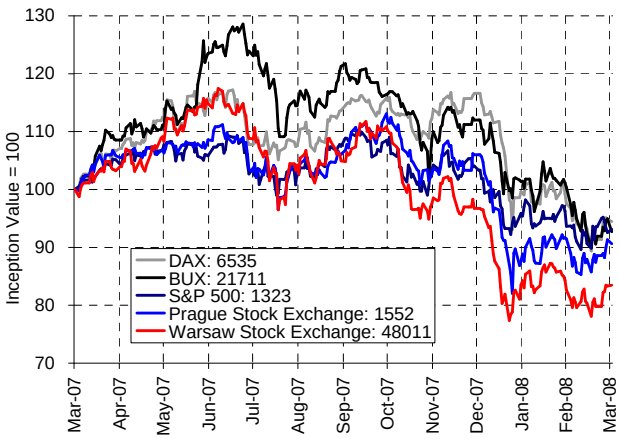
Value of Domestic Currency vs. Euro



Source: Bloomberg

Equity Markets

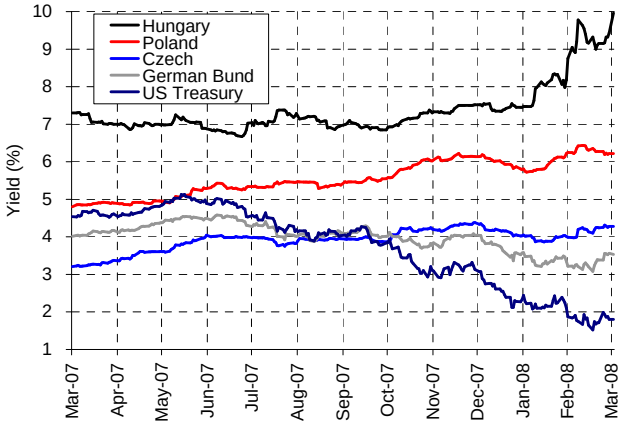
Representative Stock Indices



Source: Bloomberg

Domestic Bond Markets

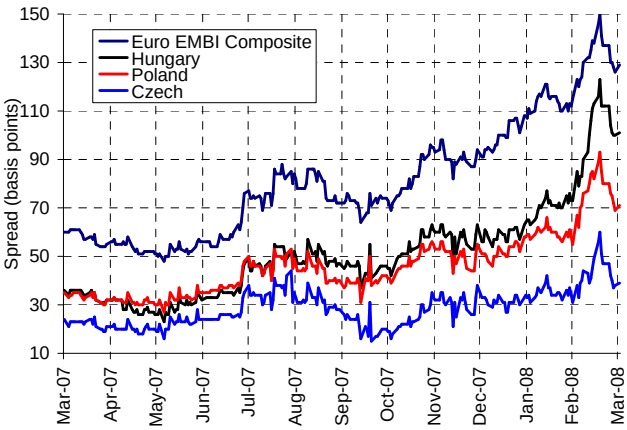
3-Year Government Bonds



Source: Bloomberg

Euro-Denominated Sovereign Bonds

Government Spreads



Source: J.P. Morgan, Bloomberg

Latest Economic Releases: Hungary

Indicator	Last Release	Actual Value	Next Release	Survey Median
NBH Base Rate	3/31/08	8.00	4/28/08	7.75
CPI Monthly	2/29/08	1.10	4/11/08	
CPI Yearly	2/29/08	6.90	4/11/08	
PPI Monthly	3/31/08	0.70	3/31/08	0.80
PPI Yearly	3/31/08	4.90	3/31/08	5.20
Avg Gross Wages Y/Y	3/19/08	-1.50	4/17/08	8.00
GDP YoY (Constant Prices)	3/7/08	0.80	5/15/08	
Industrial Production M/M	3/14/08	1.00	4/8/08	
Industrial Production Y/Y	3/14/08	6.10	4/8/08	
Current Account Q/Q (EUR Mn)	3/31/08	-1,113.27	3/31/08	-1,200.00
Foreign Trade Bal. M/M (EUR Mn)	3/7/08	-70.50	4/4/08	
Consolidated Govt Budg (HUF Bn)	2/29/08	-182.10	4/4/08	
Unemployment Rate	3/28/08	8.00	4/28/08	
PMI SA	3/3/08	50.60	4/1/08	
Retail Trade Yearly (%)	3/21/08	-3.00	4/23/08	

Sources: Bloomberg Economic Releases