The Evasional Kuznets Curve[1]

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Jan Hanousek, CERGE-EI, and Filip Palda, ENAP

Abstract

Using surveys of the Czech Republic we measure how the percentage of tax evaders evolved from 1995 until 2006. We find that at first evasion rose, leveled off, and then fell along a quadratic path, suggesting the existence of what we call an evasional Kuznets curve.

Keywords: Underground economy, tax evasion, Markov chains, transition, evasional Kuznets curve.

JEL Codes : H26, H43, K42, O17

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[1] Jan Hanousek is Professor at CERGE-EI, a joint workplace of Charles University and the Academy of Sciences of the Czech Republic. Filip is Professor at the École Nationale d'Administration Publique, Canada and visiting professor at CERGE-EI. Emails: Jan.Hanousek@cerge-ei.cz, Filip_Palda@enap.ca. We thank Randy Filer and Stepan Jurajda for their comments on an earlier draft of this paper. This research was supported by the Grant Agency of the Czech Republic (402/04/0166), the Phare ACE Programme of the European Union (P97-8119-R) and the Volkswagen Foundation (II/75831). The authors gratefully acknowledge comments from participants at the Czech Economic Association meetings of 2006 (September), and the Belgian Federal Administration Social Security Conference (May 2007).

1. Introduction

Research into tax evasion falls into three parts: measuring the value of evaded taxes, theorizing about and measuring the structural equations that predict the partial equilibrium response of an individual to a change in preferences or incentives, and measuring the social costs of evasion. Nowhere in this spectrum of research interests is there mention of an Evasional Kuznets curve. We coin the phrase in the present paper to mean a rising and then declining trend in tax evasion. We invoke Kuznets' name because it has become standard to associate it with a rising and then falling undesirable by-product of economic development, such as income inequality, and pollution.

With surveys of the Czech Republic we conducted in 2000, 2002, 2004, 2006 we track the transitions individuals make between evading and paying taxes. These surveys asked individuals whether they were presently evading and whether they evaded taxes two and five years in the past. We find that within a 95% confidence interval the *number* and percentage of evaders rose until the early millennium and then started to fall. This rise and fall can also be gleaned from macroeconomic estimates of the *value* of the shadow economy in the Czech Republic, provided by Schneider et al. (2004), and Schneider (2005, 2006, 2007). Feige and Urban (2008) have also noted rising and falling tax evasion in transition countries but do not dwell on this result because of their misgivings about the quality of macro estimates of tax evasion, such as the electricity approach. Our study uses both macro estimates and micro estimates of evasion and finds that both lead

to the same conclusion about the trend in evasion in the Czech Republic during its transition from a communist to a capitalist economy.

The existence of Kuznets curve challenges us to ask why tax evasion should follow such a radically non-linear path during economic transition. We suggest that the evasional Kuznets curve may be a curve along which evasion rises as taxes increase, due to the increased benefits of evasion, summed with a curve along which evasion falls as governments become less corrupt and "tax morale" improves. Separating these two curves and estimating their parameters may aid a country in knowing what it must do to crest the evasional Kuznets curve.

2. Data and evidence

Our data come from four surveys of residents of the Czech Republic we carried out in 2000, 2002, 2004, and 2006. Almost all respondents were Czechs or naturalized Slovaks, all with an excellent command of Czech. Our surveys are similar to those of Lemieux at al. (1994) and Fortin et al. (2000). Their interviews (in their case as well as in ours, face-to-face interviews) gathered information about how much tax people evade and why they evade.

Table 1 uses contemporary as well as retrospective answers from our surveys on evasion to show the rates of evasion and their 95% confidence intervals for the 2000, 2002, 2004, and 2006 surveys of the Czech Republic. The column labeled 2000 survey shows rates of

evasion based on respondents' retrospective answers concerning 1995 and 1999 and their present answer concerning 2000. Other columns can be similarly read.

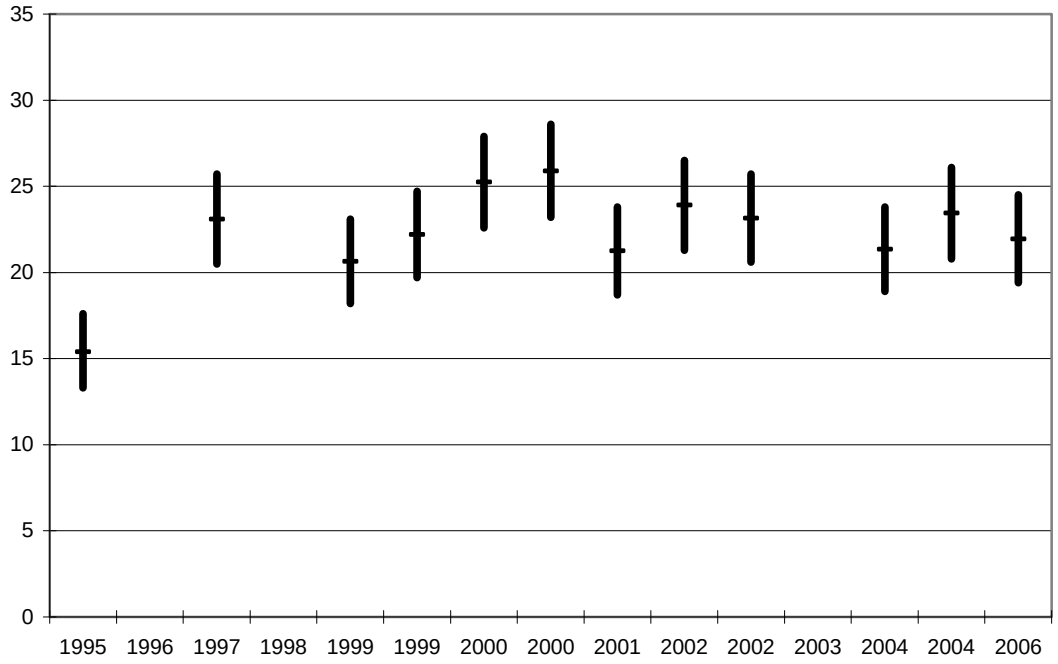
Table 1: Tax evasion rates and confidence intervals for the 2000, 2002, 2004, and 2006 surveys

Year	**2000 survey**	**2002 survey**	**2004 survey**	**2006 survey**
1995	15.4% (13.3%, 17.6%)	NA	NA	NA
1997	NA	23.1% (20.5%, 25.7%)	NA	NA
1999	20.6% (18.2%, 23.1%)	NA	22.2% (19.7%, 24.7%)	NA
2000	25.2% (22.6, 27.9%)	25.9% (23.2%, 28.6%)	NA	NA
2001	NA	NA	NA	21.2% (18.7%, 23.8%)
2002	NA	23.9% (21.3%, 26.5%)	23.2% (20.6%, 25.7%)	NA
2004	NA	NA	21.4% (18.9%, 23.8%)	23.4% (20.8%, 26.1%)
2006	NA	NA	NA	22.0% (19.4%, 24.5%)

Source: Our 2000, 2002, 2004, 2006 surveys of tax evasion in the Czech Republic. NA indicates "not applicable". The first lines contain the mean of each category expressed in percents, the second lines give estimated 95% confidence interval.

To better grasp Table 1 we have mapped the confidence intervals it contains into Figure 1.

Figure 1. **Trends in estimated confidence intervals for percentage of tax evaders.**

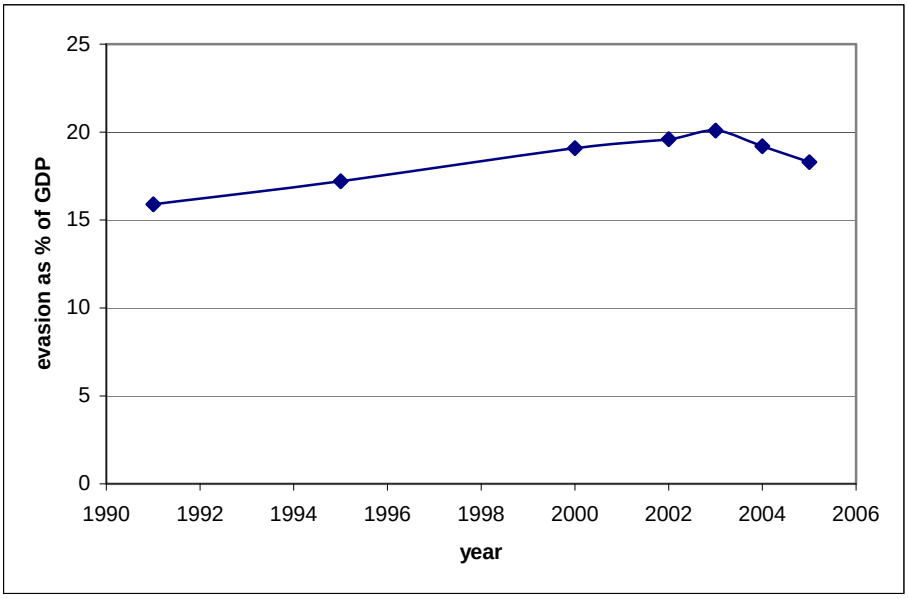


Some of the bars in Figure 1 are for different surveys but for overlapping years. The overlap accounts for the repeated values of certain years on the time axis. For example, the figure shows evasion for 2000 drawn from our 2000 survey, and evasion for 2000 drawn from our 2002 survey. There are also overlaps for 2002 and 2004, as can be gleaned from Table 1, from which Figure 1 derives. Overlaps appear in Figure 1 as bars encircled by ovals.

The pattern to emerge from Figure 1 is that evasion rose throughout the 1990's and leveled off since the new millennium. Chi-square tests indicate that between 1995 and 1997 tax evasion, as measured by the percentage of evaders, was rising but that after this evasion continued to fall into 2006.

The dynamics of the *rates* of evasion revealed by the surveys are similar to the dynamics of the *value* of evasion to be found in the macroeconomic estimates of evasion provided by Schneider (2005, 2006, 2007) and Schneider and Klinglmair (2004). These estimates appear in Figure 2. Figure 2 indicates that macroeconomic estimates of the value of evasion rise steeply for the 1990's and decline after the new millennium.

Figure 2: Evasion as a percentage of GDP in the Czech Republic 1991-2003 according to Schneider et al.



Source : Schneider (2005, 2006, 2007), Schneider and Klinglmair (2004)

Both microeconomic data (Figure 1) and macroeconomic data (Figure 2) suggest that the Czech Republic may have turned the peak of an "evasional Kuznets curve."

3. Components of the evasional Kuznets curve

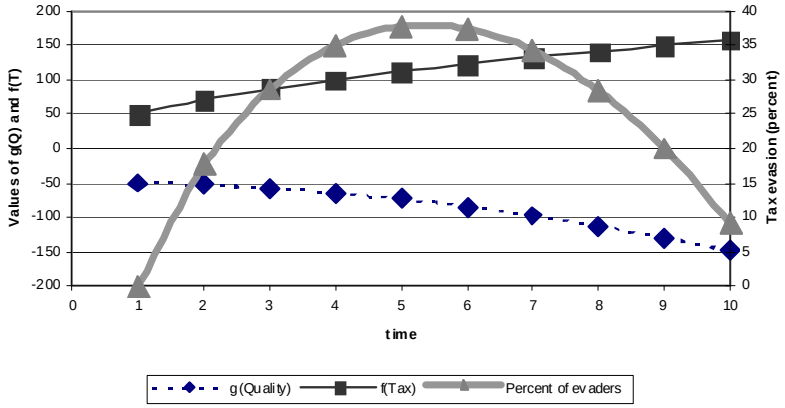
In the fall of 1989 the Czechoslovakia began an abrupt transition from being a centrally managed economy to a decentralized market economy. Among East Bloc countries

Czechoslovakia possessed perhaps the most rigidly conservative economy. Whereas glasnost and perestroika were already well underway in the Soviet Union, Czechoslovakia was still ruled by elites who owed their placement and outlook to the conservative and highly centralized Brezhnev era. After Czechoslovak communism fell, central control of industry became paralyzed or simply disappeared. For perhaps the first half of the 1990's the part of Czechoslovakia that became the Czech Republic experienced so rapid a transition to a free market economy that collection of taxes was difficult. Public confidence in the welfare state was also shaken by substantial property restitution which left thousands in doubt about whether they could hold on to their dwellings. By the mid-1990's governments had answered many questions about their ability to deliver social services. Governments also developed a reliable infrastructure for collecting income and sales taxes. The heavy flow of foreign direct investment (the largest in all former East Bloc countries) also ensured a steady stream of taxes from Western businesses accustomed to complying with tax laws.

Our cursory summary of transition in the Czech Republic contains two features of change that may explain the presence of an evasional Kuznets curve. A prominent feature of transition economies in general, and the Czech Republic in particular, is that over the transition tax rates rise as does government indebtedness, itself a foreboding of higher taxes. As Schneider and Enste (2000) write "In almost all studies, the increase of the tax and social security contribution burdens is one of the main causes for the increase of the shadow economy." While taxes are rising, confidence in government may also be changing. The first generation of democratic politicians and functionaries may need

several years to impose measures of probity and accountability to bureaucracies formerly schooled in obsessive secrecy. During this "wild west" period of transition bribes may be the best way of gaining government favour and corruption may balloon. As politicians learn to tame corruption there is evidence that citizens will respond by cheating less on their taxes. Loayza (1996) found that strong and efficient government institutions are negatively correlated with tax evasion in a general equilibrium model of fourteen Latin American countries. Hanousek and Palda (2004) found strong evidence in their surveys of the Czech Republic that people who believe government is honest pay more taxes than those who believe otherwise, all other things held constant. Complementary research by Luhiste (2006) for the Balkans finds strong evidence that people trust their government more if the economy is doing well and if their perceive politicians to be doing a good job. The second half of the 1990's was a period when Czechs reported a growing confidence in the performance of government, and also was a period of sustained economic growth. Both factors might have contributed to rising tax collections during the late 1990's. Adding the two contradictory forces of rising tax rates and rising levels of confidence in government can produce an evasional Kuznets curve.

Figure 3: The evasional Kuznets curve as the sum of the influence of perceived quality of government services and index of taxes



A simple simulation shows how the evasional Kuznets curve might be generated. From period one to period ten an index of tax rates *T* rises from one to ten. In this period an index of the perceived quality of government services *Q* also rises from one to ten. Evasion for this example is an additive function of the tax and quality indices taking the general form *E=f(T)+g(Q).* The particular form we give this function for illustrative purposes is

$$E = \underbrace{50T^{\frac{1}{2}}}_{f(T)} - \underbrace{(Q^2 + 49)}_{g(Q)} \qquad (3)$$

Evasion is a rising function of taxes and a falling function of the quality of government services. Figure 3 maps both the *f* and *g* functions and their sum, which gives the rate of evasion over time and resembles an evasional Kuznets curve. The above exercise proves nothing, but suggests that the evolution of evasion over time depends on:

1) The functional dependence of evasion on possibly countervailing forces such as quality of government services, and tax rates.

2) The evolution of quality and tax rates.

The above example is simplistic because it deems tax rates and the quality of government services are the only influence on evasion, or that changes in these factors are the only influence on evasion over time. We formulated the example in such a manner as to join the two forces that students of evasion believe to be among the most potent determinants of evasion. We also chose this example because it has some empirical backing. Taxes rose in the Czech Republic after 1989. Perceived quality of government services are

harder to measure than taxes, but following the methodology of Hanousek and Palda (2004) we found from our four surveys that since 2000 Czechs are increasingly satisfied with government services, and see corruption as declining. Czechs also increasingly believe it is immoral to evade and that family reactions to evasion are becoming increasingly negative. If both taxes and quality were rising and working against each other in their effect on evasion, the sum of their opposite influences might have given rise to an evasional Kuznets curve over the period we studied.

Empirical work has already been done on estimating the parameters of the both the *f* and *g* functions postulated above. An interesting challenge for future research is to see whether these regressions can jointly generate a Kuznets curve consistent with observed data. If the venture is successful then researchers may have a method for predicting when to expect the turn in the evasional Kuznets curve, if it has not yet already come.

4. Discussion

We have found evidence of an evasional Kuznets curve for the Czech Republic during its transition years using micro and macro data sources. An echo of a similar result is to be found in the recent work of Feige and Urban (2008) who have thrown down the gauntlet to those who would use macro measures of tax evasion, such as the electricity and money demand methods. We too are skeptical of macro estimates (Hanousek and Palda 2006) and believe that before the notion of an evasional Kuznets curve can be seen as something other than a blip in the history of one country, many other surveys of evasion in transitional countries will have to be conducted. While many countries of the former East Bloc seem to have come out of transition, some have yet to do so, and many

countries in the developing world also await their transitions. Knowing that they may face an evasional Kuznets curve may give them some sense of the importance of coordinating tax collection policies with governance measures.

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