
Response

David E.A. Giles* and Lindsay M. Tedds**

KEYWORDS: UNDERGROUND ECONOMY ■ TAX EVASION ■ ECONOMETRICS ■ EFFECTIVE INCOME TAX RATES ■ CASH ■ PUBLIC POLICY

INTRODUCTION

Roderick Hill and Roger S. Smith have made many fine contributions to the literature on the underground economy in Canada, and we are most grateful to them for their informed and insightful comments on our recent book, *Taxes and the Canadian Underground Economy*, and the research program that spawned it. They have raised several interesting and pertinent points, and we appreciate having the opportunity to make some comments by way of a response. The reviewers, and most readers of *Taxes and the Canadian Underground Economy*, understand all too well the conceptual difficulties of trying to “measure the immeasurable.” Yet, in a sense, this was part of the task that we set for ourselves when we embarked upon this project. Whatever methodology one adopts in a situation of this kind, assumptions must be made and data issues must be resolved, and many of these assumptions and issues are open to debate. On the other hand, there is at least one positive aspect to all of this—since we cannot observe the underground economy, no one can say that a particular estimate of its size is “wrong!” Of course, some estimates will appear to be more sensible, more in accord with various snippets of related evidence, and based on more plausible assumptions than will other estimates. Given this consideration, we hope that readers will view our study and our results positively.

MEASURING THE UNDERGROUND ECONOMY

One important object of our research was to see what results we would obtain by applying the “multiple indicators, multiple causes” (MIMIC) approach to modelling the underground economy to Canadian data. Previous work by one of us (Tedds) for Canada and by the other (Giles) for New Zealand suggested that this research agenda would be a fruitful one. As Dr. Hill notes in his concluding remarks, until now empirical research into the size of the aggregate underground economy in

* Of the Department of Economics, University of Victoria.

** Of the Department of Economics, McMaster University.

Canada has been dominated by monetary methods. Apart from anything else, the robustness of these previous results in the face of a change in methodology should be of considerable interest. Dr. Smith seems to agree with our assertion that our estimates are broadly in accord with other results for Canada, and we also demonstrate in our book that they are in line with independent estimates for similar OECD countries. On the other hand, we are painfully aware that “two wrongs don’t make a right.” Dr. Hill is quite correct in saying that some of the published estimates for certain other countries are based on questionable assumptions and techniques, and there is not much comfort to be gained from corroborating demonstrably questionable results! Overall, however, we feel that our estimates of the size of the Canadian underground economy are defensible, given the very broad definition of underground activity that we adopted in our study.

What our book provides, for the first time in Canada, is a series of annual estimates of the output generated in the (broadly defined) underground economy. Our estimates cover, on an annual basis, the period 1976 to 1995. Whatever caveats one may put on these numbers, they undoubtedly constitute an interesting new resource. Rather than a series of “snapshots” of the underground economy, our results provide a bigger picture—one that shows how this area of economic activity has apparently evolved over a considerable period of time, and one in which the data have been estimated on a consistent basis over time. In contrast, the information that was available previously was rather patchy, both in terms of the years of coverage and in terms of the mixture of underlying methodologies and assumptions. The reviewers rightly note that our numbers for the size of the underground economy are estimates—something that we stress repeatedly in our study—and that their reliability is of interest. We believe it is significant that we provide not only point estimates of the size of the underground economy but also a confidence interval to go with these numbers, year by year. No other studies of the underground economy, for Canada or for any other country, have provided information of this type, information that enables us to *qualify* the results.

Although other researchers have used the MIMIC model to estimate the size of the underground economy in other countries, and though the model has been used very widely in all of the social sciences for other purposes, both reviewers rightly question some of the details of its use in our study. Dr. Hill correctly picks up on our own discussion of the difficulty of knowing what it is that the model is actually measuring. Is it really the underground economy, or is it something else? We acknowledge that the equivalent question can arise in any application of the MIMIC model, and that to some extent one’s confidence in the answer depends upon the choice of “indicator” and “causal” variables. We have paid more attention to this point than many researchers do—to the extent of including new causal variables, such as the number of holders of more than one job and the extent of self-employment.¹ Of course, there is always scope for debate about both the relevance of the chosen variables and the appropriate way in which to measure them. Both of the reviewers pick up on this point, and we acknowledge that there is certainly room in which to reconsider some of our choices. Of course, we would also add

that in our study we actually present the results of a range of specifications of the MIMIC model, with a variety of indicator and causal variables, and that the results are extremely robust in the face of changes in the array of variables.

An important aspect of our overall estimation methodology is the conversion of the *index* for the size of the underground economy that the MIMIC model generates into a series of values for the *actual* size of the underground economy (in dollar terms, say, or as a percentage of measured GDP); that is, it is necessary to “calibrate” the underground economy estimates. Both reviewers raise points about this aspect of our study. The situation is akin to one in which we have a series of values for the consumer price index (CPI)—that is, a measure of percentage changes in prices—but what we want is a series for the price level itself. Given a benchmark value for the price level at one point in time, one can use the percentage changes that are implied by the price index to generate a series of price levels, period by period. As may be clear to the reader from the reviewers’ comments, we have achieved this conversion for the underground economy by using a completely different model to get a separate estimate of the underground economy (as a percentage of measured GDP) at one point in time—namely, at the mid-point of our sample period, 1986. This other model is a novel demand-for-cash model—one that allows for the presence in the economy of both a measured sector and an underground sector. Admittedly, in other respects this model is rather sparsely specified, so although we are willing to use it to get an average value for the underground economy we are not willing to use it (alone) to generate estimates of the underground economy, year by year. From this model, the size of the underground economy is estimated to have amounted to 9.45 percent of measured GDP in 1986. This gives us the benchmark, or calibrating level, that we need. Dr. Smith asks what values our separate demand-for-cash model would have obtained for the other years. In fact, we have generated the corresponding figures for each year in the sample, and they range from 7.3 percent to 13.8 percent of measured GDP. By way of contrast, our final estimates based on the MIMIC model results range from 3.5 percent to 15.6 percent. Dr. Hill also notes that the specification of our demand-for-cash model may be crucial to the numbers that we obtain. We certainly agree that great care must be taken in the specification of this model—a lot hinges on it as far as the numbers for the underground economy are concerned. This area is undoubtedly one that warrants further study, but we would note that our limited experimentation with alternative specifications of this model did not produce markedly different results, and that our concern about arriving at a correct specification is reflected in our provision of the results of various diagnostic tests in table 7.7 of our book. Of course, it is the MIMIC model itself that provides our estimates of the dynamic timepath of the underground economy, and the estimated growth rates are obtained quite independently of the demand-for-cash model.

TAX POLICY AND THE UNDERGROUND ECONOMY

A second, and crucial, purpose of our work was to investigate the links between tax policy and the size of the underground economy. Having generated a series of estimates for the Canadian underground economy, year by year, for a 20-year period, our next step was to consider what uses this new information could be put to. Perhaps the most compelling question that one can address, albeit in various ways, now that these data are available, is, How do changes in tax policy affect the size of the underground economy? There seems to be little disagreement that this question is an important one. Several chapters in our book explore the theoretical basis of the issue and then go on to look at some of the links between various tax variables and our estimates of output in the underground economy. Dr. Smith expresses some concerns about this part of our analysis. Essentially, these concerns come down to two matters: first, we use “effective” tax rates rather than statutory (marginal or average) tax rates in our simulations; second, the analysis is at a macroeconomic level rather than a microeconomic level.

The first issue is one that we discuss in the very last section of our book.² As we note there, it is by no means a simple matter to work with the statutory rates in this context, especially given the federal-provincial distinctions that one must take into account. Having said this, however, we do acknowledge that from a purely policy perspective it would be highly desirable to undertake a careful analysis of the links between our measure of the underground economy and changes in the statutory marginal and average tax rates. After all, it is these rates that are at the mercy of the policy maker. Regrettably, this analysis is something that we have not had the opportunity to pursue to date. As Dr. Smith notes, the results that we present in our study are based on the “effective” tax rate—that is, the ratio of total tax revenue to GDP. This measure is the one that is used by the OECD in its international comparisons of the tax burden. Our use of this measure, therefore, is helpful if our results are compared with the results for other countries. In hindsight, however, we have to acknowledge that changes in the “effective” or “average” tax rate may come about for more reasons than one. To be specific, this rate may change as a result of changes in the statutory tax rates while the tax base remains the same; or it may change simply as a result of movements in GDP itself. In other words, it would be helpful to work with a measure of the tax rate that was truly exogenous, rather than one that is effectively endogenous. There is nothing more advantageous than hindsight!

As to the matter of macroeconomic analysis, as opposed to microeconomic analysis, it should first be noted that in this respect we are in very good company. By far the largest portion of previous empirical research into the Canadian underground economy—including that of Dr. Smith and Dr. Hill—has been conducted at the macroeconomic level. As both reviewers undoubtedly recognize, macroeconomic data have the advantage of availability. Regrettably, microeconomic data are far less readily available to the lowly academic researcher. Both reviewers make the valid point that there would be much gain from the analysis of detailed microdata.

We agree wholeheartedly. In an ideal world, we would have based our analysis on data from individual tax returns, or the like. In his concluding comments, Dr. Smith refers to the potential interest in “modelling the probability of non-compliance on the basis of variables that characterize Canadian businesses and individuals, an undertaking that would be similar to work Giles reportedly did in New Zealand.” Again, we share his enthusiasm for an undertaking of this kind. Of course, the published work to which he refers—and for which we provide a clear citation in our own study—made use of confidential unit records for all businesses that the New Zealand Department of Inland Revenue audited over a three-year period.³ Only the goodwill of the New Zealand tax authorities made this microeconomic study possible, and the study was undertaken in the context of a much broader consulting exercise. The willingness of the New Zealand tax authorities to involve themselves in open research of this kind is certainly to be commended, and we would welcome the opportunity to gain access to similar data for Canadian taxpayers so we could undertake similar research for this country.

THE INTERNATIONAL PERSPECTIVE

A third object of our study was to provide an up-to-date overview of the research methods and results associated with attempts to measure the underground economy in other countries. Of course, we needed an overview of this kind to set the scene for our own work—to put it into perspective. We believe, however, that our survey went a lot further than this. The first five chapters of *Taxes and the Canadian Underground Economy* will, we hope, be of interest to the general reader who simply wants to gain an appreciation of the general procedures that researchers have adopted in trying to measure the underground economy, and who wants to get a feel for the likely magnitude of underground activity in various countries. Dr. Smith is correct in saying that much of this information is available elsewhere, but to the best of our knowledge it is not otherwise available in one document; the overview by Schneider and Enste is far less comprehensive in its coverage.⁴

SOME FINAL COMMENTS

When we embarked on the research that culminated in the publication of *Taxes and the Canadian Underground Economy*, we knew that we were stepping into a potential minefield. Our expectation was that professional economists, tax specialists, politicians, and “Joe public” would all prove to be unabashed “experts” when it comes to this topic. We were not disappointed! As we anticipated, our work has been the focus of a good deal of attention—from our academic colleagues, from the national media, and from the public at large. Fortunately, by far the greatest part of this attention has been resoundingly positive. Countless “talk-back” radio shows and interviews with various divisions of the media have persuaded us not only that the underground economy is “alive and well, and living in Canada,” but also that it captures the imagination of a wide cross-section of our community. Perhaps surprisingly, public opinion has favoured the view that our estimates of underground

activity in this country are somewhat conservative. Everyone has a story to tell, of course, and everyone tends to be very keen to convey it. At the anecdotal level, the activities associated with our research have been fun, to say the least!

Clearly, there are no definitive answers to the related questions, “how big is the underground economy in Canada?” and “how does tax policy affect its size?” In our study, we have tried to tackle these questions by using up-to-date estimation techniques and official data. It seems clear that we have stimulated the interest of a relatively wide audience, including our two reviewers. We thank all of the members of this audience for their constructive and stimulating input. We hope that our research, made possible only through the impartial support of the Canadian Tax Foundation, will encourage others to dig deeper into these matters.

Our academic colleagues have provided numerous supportive and constructive comments and suggestions, and of course (with gratitude) we count Dr. Hill and Dr. Smith in this company. As a result of these suggestions, Tedds has begun work that revises the model presented in our book, with a particular emphasis on expanding and refining the choice of variables. In addition, she intends to address the weaknesses in our current work regarding the link between tax policy and the size of the underground economy. We look forward to further constructive debate on this topic.

NOTES

- 1 We are grateful to Dr. Smith for providing additional references related to the potential importance of self-employment as a factor in determining the magnitude of the underground economy. It should be emphasized, however, that this factor has not been taken into account in applications of the MIMIC model for other countries.
- 2 David E.A. Giles and Lindsay M. Tedds, *Taxes and the Canadian Underground Economy*, Canadian Tax Paper no. 106 (Toronto: Canadian Tax Foundation, 2002), 239.
- 3 David E.A. Giles, “Modelling the Tax Compliance Profiles of New Zealand Firms: Evidence from Audit Records,” in Gerald W. Scully and Patrick J. Caragata, eds., *Taxation and the Limits of Government* (Boston: Kluwer Academic Press, 2000), 243-69.
- 4 Friedrich Schneider and Dominik H. Enste, “Shadow Economies: Size, Causes, and Consequences” (2000) vol. 38, no. 1 *Journal of Economic Literature* 77-114.