

# **An analysis of the efficacy of Tax Justice Network’s methodology in constructing a secrecy index**

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## **Summary:**

In 2013, the Tax Justice Network (TJN) released its most recent financial secrecy rankings, with Switzerland topping the list. According to TJN, the index is constructed to “shine light into dark places” so as to expose jurisdictions that support clandestine financial operations and tax avoidance. The study has received quite a bit of attention, including a recent article in *The Economist*. TJN’s final secrecy score has two components, one that uses 15 different indicators to measure “secrecy,” and one that controls for the weighted size of the financial industry in each jurisdiction. Regrettably, analysis of the study reveals several serious methodological flaws, where numerous assumptions have been made without the aid of economic or statistical theory. For one, absolutely nothing is done to control for the many factors that may influence the size of the financial industry in a given jurisdiction. In fact, financial size is *negatively* correlated with the financial secrecy variable in TJN’s sample. Additionally, all 15 indicators contribute equal weight to the final secrecy score without any assessment of the validity of this approach. For example, the same weight is given to the existence of bilateral tax treaties and any collection of beneficial ownership information (arguably the biggest secrecy driver), without even considering tax information exchange as a viable alternative for countries without direct taxation. The equal weighting seems additionally strange when one considers that for one of the indicators related to banking secrecy, every jurisdiction receives the worst identical score, effectively ensuring that all areas show a degree of secrecy, while biasing the results against larger financial areas. Finally, as demonstrated, the results are extremely sensitive to even small changes in seemingly innocuous assumptions. As such, TJN’s rankings are essentially a list of large financial centers with superfluous random noise. If subjected to a rigorous peer review, it is this reviewer’s opinion that the study could not be published in a respectable outlet due its several methodological deficiencies.

## **About the reviewer:**

Aaron Smallwood received his PhD in economics from Florida State University in 2001. Since, Dr. Smallwood has been a member of the economics faculty at the University of Oklahoma and the University of Texas-Arlington, and a visiting professor at Tongji University in Shanghai, People's Republic of China. Currently, he is an associate professor of economics at The University of Texas-Arlington and regularly teaches international finance in the U.S. and China. Dr. Smallwood has written and published numerous papers on various topics in international finance and the statistical analysis of time series data in high quality peer-reviewed journals. Dr. Smallwood's most recent publication, "Exchange rate shocks and trade: A multivariate GARCH-M approach," in *Journal of International Money and Finance*, assesses the extent to which exchange rate uncertainty affects trade and the relationship between trade and exchange rate changes for a large set of developed and developing economies.

The views expressed in this report are those of Dr. Smallwood's alone and do not necessarily represent those of The University of Texas-Arlington and/or any of its staff. He is not directly affiliated with Cayman Finance or any of its affiliates.

## Introduction

The Tax Justice Network's (TJN's) website states that it conducts "high-level research, analysis and advocacy on international tax" and related issues. Among its publications is a "Financial Secrecy Index" published most recently in late 2013. TJN presumes that personal and company financial information should be open. The more protection provided, the worse the score. The "worst" actors, by TJN measures, are Switzerland, Luxembourg and Hong Kong. The best country in the world is St. Kitts & Nevis. Ironically, in corruption rankings provided by Transparency International, Switzerland, Luxembourg and Hong Kong are ranked among the world's most honest governments.<sup>1</sup> This inconsistency is odd.

## TJNs' Assumptions

To best understand the major flaws in TJN's analysis, a brief review of its methodology is necessary.<sup>2</sup> Since 2009, TJN has been publishing a financial secrecy index to rank secrecy jurisdictions, which it defines as places that "use secrecy to attract illicit and illegitimate or abusive financial flows." The study uses a broad set of measures related to banking secrecy, money laundering laws, and the existence of bilateral treaties (or lack thereof) to construct a score related to secrecy that is used in conjunction with a weighted measure of the size of the financial jurisdiction in each country. Since 2009, the study has expanded to include 82 total areas, up from the 60 initially considered.

There are two components to the Financial Secrecy Index score. The first component, labeled "secrecy score," is calculated by assessing whether or not a given jurisdiction effectively mitigates secrecy along one of 15 different dimensions. The best score that can be achieved for a given category is 0, and the worst is 1. For example, if a jurisdiction has signed and ratified at least 46 bilateral treaties with others that conform to the OECD's 'upon request' information exchange, then the given jurisdiction receives a score of 0 for this category. Others are weighted according to the percentage of treaties that have been signed relative to 46. Once a score has been assigned for each of the 15 "key financial secrecy indicators" (KFSI), the secrecy score is calculated by first summing the value for all 15 categories. This total is then divided by 15 before being multiplied by 100. The final secrecy score, which I denote as  $S$ , ranges from 0 (no secrecy) to 100 (fully secretive).

The second component of the financial secrecy index score is a weighted variable that measures financial export services using IMF data. The total volume of world exports in financial services is calculated, and the jurisdiction's share, which ranges from 0 to 1 and is denoted  $W$ , is obtained as their proportion of the world financial services that are

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<sup>1</sup> Available at: <http://cpi.transparency.org/cpi2013/>.

<sup>2</sup> Details of TJN's methodology can be found at: <http://www.financialsecrecyindex.com/introduction/notesmethodology>.

exported. Finally, the aggregate value for Financial Secrecy Index, which I denote FSI, is given as follows:

$$FSI = S^a W^{1/a} / 100, \quad (1)$$

where  $a$  is set to 3 so as to essentially keep the variance of FSI low.

Understandably, for a project of this magnitude a number of assumptions must be made. However, the constructed variable, FSI, is fundamentally flawed in a way that can confuse those trying to understand issues related to tax evasion, banking secrecy, and money laundering. Throughout, many of the choices are arbitrary, with little or no attempt made to justify them on the basis of statistical or economic theory.

There are four major problems with the construction of FSI. First, there is no attempt to control for many variables that affect the size of the financial industry in a given area. For this, and several other reasons, the results would appear to be biased against large financial centers. Secondly, no attempt is made to understand whether any component used in  $S$  should be weighted higher or lower than others. The decision to assume that each component affects secrecy equally is capricious, and as documented below, unnecessary. Third, it would appear likely that the construction of the variable  $S$  ultimately results in potentially double counting for certain perceived institutional transgressions. Below, in detail, I document the problems associated with the construction of both  $W$  and  $S$ , along with a discussion of preferred methods for addressing these problems. Finally, the results are disturbingly sensitive to the selected value of the parameter  $a$  in equation (1) above.

## **Methodological concerns with constructing the financial weights**

As just noted, the FSI ranks jurisdictions in terms of the size of their financial services industry. Seven of the eight largest financial centers are in the top FSI eight spots. Among these seven jurisdictions, not one achieves a score for  $S$  that for this variable alone would place it in the top 20. The United States, which has the sixth highest aggregate score for FSI, has the 56<sup>th</sup> highest score for  $S$ . Taking this further, if the United States were assigned the lowest value for  $S$  achieved in the sample (32.4 for Sweden), it would still fall in the top half of the most “secretive” countries in the world by virtue of the size of their financial services sector. The jurisdiction with the worst secrecy score, Samoa, actually ranks 76<sup>th</sup> in terms of TJN’s total FSI, which is because of the small size of Samoa’s financial industry.

There is additional reason to suspect that FSI is biased against large financial centers. Among the key financial secrecy variables considered, the third one is associated with whether or not a jurisdiction requires all companies to supply beneficial ownership information, once incorporated, to an official agency. Not a single jurisdiction in the sample does so, such that for this component every country is assigned the value 1.

Further, the fourth category measures whether or not legal and beneficial ownership for companies is made publicly available online. Again, no country in the sample requires the publication of beneficial ownership and only a small handful require the publication of legal ownership. Finally, the fifth category assigns a value of 0 for jurisdictions that require “all types of companies with limited liability to file their annual accounts and make them readily available online.” Here, only 12 of 82 countries, primarily concentrated in Europe, do so. Essentially, the variable  $S$  contains three categories where all, or the vast majority of countries, receive the worst possible score. While it is true that this result will apply to all countries in the sample, it disproportionately affects countries with large financial centers. To be specific, let  $s_{i,j}$  denote the secrecy score for category  $i$  and country  $j$ , and let  $w_j$  denote the financial weight assigned to country  $j$ . It can easily be seen that the value of FSI for country  $j$  is given by:

$$FSI_j = \frac{1}{100} \left[ \frac{100}{15} \sum_{i=1}^{15} (s_{i,j}) \right]^3 w_j^{1/3}. \quad (2)$$

Essentially, the authors have chosen three variables for which  $s_{i,j}=1$  for virtually the entire sample. Holding everything else constant, simple calculus shows that the additional effect of the  $i$ -th secrecy category on the FSI score is given by:

$$\frac{\partial FSI_j}{\partial s_{i,j}} = \frac{3}{100} \left[ \frac{100}{15} \sum_{i=1}^{15} (s_{i,j}) \right]^2 w_j^{1/3}, \quad (3)$$

which is clearly increasing with the financial weight of country  $j$ . In words, the inclusion of secrecy variables with values equal to 1 for all (or most) countries will have a disproportionately large effect on large financial jurisdictions.

The authors of the study may be unaware of this second source of bias, but they are clearly aware of the first. For example, on page 69 of the authors’ notes on their methodology, they report “[the global scale] weighting alone does not imply harbouring or supporting inappropriate behavior by the jurisdiction in question. . . . Rather, the Global Scale Weight is an indicator of the potential for a jurisdiction to contribute to the global problem of financial secrecy, if secrecy is chosen in the range of policy areas discussed above.” In other words, the rankings will clearly be much larger for countries with a larger financial industry. Regrettably, to the reader of the report unwilling to slog through the detailed notes, this point will likely be missed. Indeed there is no mention of the fact that the study is intended to capture both secrecy and the financial size of the jurisdictions in question on TJN’s webpage containing the results for the “Financial Secrecy Index,” where beneath the title the phrase “illuminating shady places” can be found.<sup>3</sup>

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<sup>3</sup> The most recent results can be found on TJN’s website at the following URL: <http://www.financialsecrecyindex.com/introduction/fsi-2013-results>.

In defending the use of scaling, the authors suggest that large financial centers should bear a large portion of the burden of ensuring transparency relative to smaller players. In the authors' words, because of the potential to attract large illicit flows, "the larger the financial sector becomes, the better its regulations and transparency *ought* to be" (page 3). This is an utterly unscientific statement. It contrasts with two simple principles taught in introductory economics. First, this statement is what an economist teaching first year classes would refer to as a "normative" economic statement as compared to a "positive" one. These are statements about how someone may believe the world "ought to be." There is no attempt to derive a testable implication. In fact, as thoroughly detailed below, there are several straightforward ways that one could attempt to use to control for size, while additionally addressing a second major concern, namely, the assumption that each KFSI affects "secrecy" equally. The second problem with the quoted passage is that at its heart it violates the "ceteris paribus" condition that economics professors attempt to drill into students. Specifically, the authors must make an attempt to control for all of the other factors that influence size, in attempting to connect financial size to the secrecy variable.

As discussed in the previous paragraph, one could develop a testable hypothesis, while both constructing a measure of size that addresses their violation of ceteris paribus, and providing a path for dealing with other egregious methodological concerns. The authors have now collected three years of data related to secrecy, along with cross-sectional information for up to 82 countries. One could easily envision the construction of a panel data set, but given some minor, albeit easily addressed concerns (such as missing observations for countries only recently included), I will keep things simple. Let  $Size_j$  denote the relative size of the financial exporting sector of jurisdiction  $j$ . One could estimate an equation of the form:

$$Size_j = \sum_{i=1}^{15} \alpha_{i,j}(s_{i,j}) + \sum_{i=1}^k \beta_{i,j}(Control_{i,j}) + \varepsilon_j, \quad (4)$$

where, as above,  $s_{i,j}$  denotes the  $i$ -th KFSI variable for the  $j$ -th country and where  $\alpha_{i,j}$  can be interpreted as the affect of the selected KFSI on a country's financial size. The term  $\varepsilon_j$  is a random error term that captures the unpredictable residual component of size. Proper analysis requires the inclusion of other important variables affecting these service exports, which are captured in a set of  $k$  variables that are denoted  $Control_{i,j}$ . From a statistical perspective, the omission of important variables affecting financial size will cause estimates of the effects of secrecy indicators to be severely biased. In this context, a voluminous literature has identified a variety of important factors affecting financial exports, including per capita income, levels of educational attainment in finance, interest rates and exchange rates, trade flows and openness, and even the distance between the importing and exporting countries (see, e.g., Moshirian, Li, and Sim, 2005, and Buch, 2005).

A number of interesting empirical questions and hypotheses could be formulated from estimation of equation (4). For example, does the failure to enact various policies aimed at deterring secrecy ultimately increase the size of financial exports for a given jurisdiction? If so, by what amount? Are there certain financial secrecy indicators that seem to be more correlated with financial size than others? For example, Johannesen and Zucman (2014) study the effects of bilateral tax treaties on financial flows and conclude that their findings are largely consistent with the existing literature, “where a recurring finding is that treaties have little real economic effects” (page 67).

As the FSI makes no attempt to disentangle the effects that secrecy indicators and other variables have on financial size, the results are likely uninterpretable. If anything, a rudimentary and incomplete analysis suggests that the authors’ own data points to, if anything, a negative link between financial secrecy and the size of each jurisdiction. For example, for the most recent index, the correlation coefficient between the secrecy variable ( $S$ ) and the financial weight ( $W$ ), for all jurisdictions, is -0.2234 and is significantly negative.<sup>4</sup> While this correlative evidence is hardly causal, it does show that within the authors’ sample financial secrecy has a tendency to decline as financial size grows. As the financial secrecy score actually increases with size, this strongly suggests that one should be extremely skeptical in interpreting the results of TJN’s analysis.

## **Methodological concerns with constructing the secrecy variables**

As discussed above, the authors’ secrecy component to the FSI score uses aggregated information from fifteen different key financial secrecy indicators. These are lumped into four categories that attempt to measure knowledge of beneficial ownership, corporate transparency regulations, efficiency of tax laws, and the extent to which jurisdictions comply with international standards and provide judicial cooperation. Regrettably, no care is taken to determine whether or not certain indicators are more important than others. Additionally, subcategories within a given KFSI are weighted arbitrarily and there seems to be little care taken to ensure a given category is not counted more than once.

It is extremely unlikely that all fifteen KFSIs would affect nefarious behavior in a given jurisdiction equally. For example, as pointed out by Johannesen and Zucman (2014), relative to providing information upon request, “automatic exchange of information is widely acknowledged to be the most effective solution (to prevent tax evasion) because it allows tax authorities to obtain comprehensive data” (page 68). As discussed above, Johannesen and Zucman (2014) also document that bilateral tax treaties have at best a modest impact on financial flows. This strongly suggests that the authors’ 12<sup>th</sup> KFSI

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<sup>4</sup> Given a sample of  $n$  countries and an estimated correlation coefficient  $r$ , one can form a test that the Pearson correlation coefficient,  $\rho$ , is equal to 0 by forming a t-statistic given by  $(1-r^2)^{-1/2}r(n-2)^{1/2}$ . The test statistic, which is distributed as a student-t random variable with  $n-2$  degrees of freedom, is equal to -2.0246, and is significantly negative at conventional test sizes.

related to automatic information exchange should be weighted higher than the authors' 13<sup>th</sup> indicator related to the ratification of at least 46 bilateral treaties. This concern is not merely academic. If an international standard based on TJN's analysis were ratified, a truly duplicitous jurisdiction could gain positive recognition by selecting to comply only with prescriptions associated with KFSIs known to have little impact on illicit flows. In this regard, it would be imperative to know which indicators truly matter.

It is unclear why TJN's analysis makes no attempt to determine how compliance or lack thereof in a given category truly affects financial activity. This could easily be accomplished through the estimation of equation (4) above, where the individual values,  $\alpha_{i,j}$ , could be used to appropriately weight each category. At a minimum, the study should have at least included some sensitivity analysis to examine how equal weighting of each KFSI affects the final results.

Interestingly, while each KFSI is weighted equally, subcategories within certain categories are created with arbitrarily selected weights. For example, the authors' fourth indicator attempts to capture the extent to which ownership of public companies is available online. For this category, if a country publishes "legal ownership" for KFSI-4, they receive only a 0.2 "credit" for being in compliance. If they also publish "beneficial ownership" they get full credit. This implies that they have determined that the publication of "beneficial ownership" is 5 times more important than legal ownership alone in measuring transparency. With no attempt to justify it, this assumption seems arbitrary.<sup>5</sup> Similar peculiar assumptions are made in numerous instances for other indicators.

Finally, it is not clear that TJN has been careful to ensure that the KFSI's do not reward (or penalize) a given behavior multiple times. For example, the ninth constructed indicator awards countries that grant tax credit for foreign taxes that are paid. However, as pointed out by Blonigen, Oldenski, and Sly (2011), bilateral tax treaties are signed not only for the purpose of information exchange, but also to promote investment by ensuring double tax relief. To a large extent, these two separate KFSIs appear to at least partially capture a jurisdiction's willingness to provide tax relief. Additionally, for the authors' first KFSI, related to banking secrecy, TJN uses two sources to determine whether or not banks in a given jurisdiction are required to keep a long history of large transactions. A credit of 0.20 is given for this category if institutions in a given area are required to "keep banking records for at least 5 years" as identified by the Financial Action Task Force. An additional credit of 0.10 is assigned if the Bureau of International Narcotics and Law Enforcement Affairs has determined that institutions are required to "maintain records over time." In essence, the study uses two sources to measure available information, resulting in double-counting efforts to record longer histories of banking transactions.

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<sup>5</sup> It is worth pointing out that according to TJN's study, no jurisdiction provides beneficial ownership and only 8 of the 82 provide legal ownership information.



The discussion in this section centers on the capricious nature associated with much of TJN's analysis. A closing point will be made to highlight the effects of the unscientific approach. From equation (1) above, TJN considered values of  $a$  ranging from 1 to 5, but ultimately selected  $a=3$  to mitigate the disparity between the 10 percentile and 90 percentile of their FSI variable. I have not placed particular emphasis on this parameter, as I do not believe the choice of this variable is critically linked to my many concerns referenced above. Indeed, the final FSI variable is likely fundamentally flawed regardless of the choice of  $a$ . However, to highlight how the assumption choices throughout affect the analysis, it is worth pointing out that the final jurisdiction rankings will be dramatically influenced by the parameter choice of this variable. For example, if the value of  $a$  is set to 1, the United States ranks as the most secretive country, while Vanuatu finds itself as the 62<sup>nd</sup> most secretive. If this value is changed to 5, the rankings change dramatically, as the United States drops to the 20<sup>th</sup> most secretive, while Vanuatu leapfrogs the United States into 18<sup>th</sup> place. The fact that a small change in this seemingly innocuous parameter can distort the rankings in this way provides clear evidence that the arbitrary choices made throughout, without any underlying statistical or economic justification, render the final rankings of TJN highly dubious.

## Summary

The onset of the global financial crisis has uncovered the tenuous budgetary conditions in many countries. This naturally caused much interest to center on the question of how much tax revenue may have been lost from deceitful financial practices. Coupled with concerns about other nefarious activities, including money laundering and terrorist financing, several researchers have attempted to identify complicity in the world's financial centers. Recently, the Organization for Economic Development and Cooperation (OECD) launched their Global Forum to investigate financial transparency throughout the world. Through careful peer review and layered analysis, the OECD has completed a review of 50 jurisdictions, which they have labeled as "non-compliant," "partially-compliant," "largely compliant," and "compliant."<sup>6</sup>

In the view of the Tax Justice Network (TJN), the OECD's analysis is not scientific enough in the sense that it fails to rank all countries, while providing a numeric score related to secrecy. Additionally, TJN has expressed concern that the OECD may be too lenient in penalizing clandestine activities protecting foreign interests. Beginning in 2009, TJN completed its ambitious attempt to measure secrecy with the first release of the "Financial Secrecy Index" (FSI). In 2013, TJN launched the most recent study covering 82 different jurisdictions throughout the world.

In spite of much fanfare and the substantial efforts of TJN, even casual analysis of the methodology reveals serious methodological concerns. These become exponentially worse with careful inspection. As detailed above, TJN fails to offer any methodological

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<sup>6</sup> For more detail on the OECD's analysis, the interested reader is referred to their website: <http://www.oecd.org/tax/transparency/>.

insight to justify peculiar assumptions that significantly distort results. The analysis generally fails to use any economic or statistical theory in making numerous assumptions that even to the casual reader will seem random. As an example, TJN assumes that each of the 15 considered secrecy indicators affect their final score for secrecy equally, in spite of consistent empirical evidence to the contrary. Explicitly, TJN assumes that the implementation of rules forcing automatic disclosure of information would have the same effect on tax evasion as would information exchange that is only available through formal request. Further, increasing the number of bilateral tax treaties would impact secrecy in precisely the same way as more stringent money laundering laws would. This contrasts the existing literature, which generally finds a weak link between financial flows and tax treaties. Additionally, these assumptions are neither palatable nor necessary. As detailed, it would be relatively straightforward to estimate an equation to determine the extent to which various indicators impacted financial service exports. In fact, TJN has not even conducted a sensitivity analysis to determine how the assumption of equal weighting impacts their results. It should also be noted that these concerns are not purely academic. Indeed, TJN's assumptions are potentially dangerous to the extent that truly deceptive jurisdictions that care about their external reputation can simply choose to enact those policies that are less likely to curb the illicit flows relative to others. As TJN has made no attempt to determine which indicators are most important, it would hardly be difficult to do so.

In conjunction with its secrecy score, TJN determines the relative financial export services size of each area, so as to measure the potential scope of concealment. While the desire to account for financial size is understandable, again, TJN's analysis here is likely flawed. The authors make no attempt to determine the extent to which financial size is affected by any factor, much less their own secrecy scores. This is especially problematic, as their data demonstrates correlative evidence suggesting the link is negative. While one could not definitively conclude that this creates a direction of causality, it does raise immediate concerns with their final secrecy score (FSI), which is obtained as the product of two functions of the secrecy scores and financial weights. In fact, for the countries with the six highest FSI scores, all are ranked in the top 8 largest financial centers, while none obtain a secrecy score that would even place them in the top 20. The United States, which obtains the 56<sup>th</sup> highest secrecy score, ranks 6<sup>th</sup> by virtue of their financial size alone.

The rankings of TJN would appear to be uninformative in trying to address which jurisdictions pose the biggest threat in terms of financial secrecy for illicit purposes. Even if one were to accept all of the selected assumptions, it is extremely telling to note that the change in a single seemingly innocuous un-estimated parameter could ultimately move the United States to the top spot. If changed by a small amount, within the bounds accepted by the authors, the change in this single parameter could move the United States down to the twentieth most secretive country and below economies such as Vanuatu. Unfortunately, suboptimal modeling and an exhaustive list of arbitrary assumptions render a final product that is not only difficult to interpret, its formal implementation as a measuring stick of secrecy could produce a dangerous result, where jurisdictions could take advantage of many of the deficiencies uncovered in this analysis.

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