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ABSTRACT

Corruption and tax evasion are significant problems that economies face, and though they are separate issues, they are interconnected and have a significant effect on each other. Research has shown that corruption affects the tax compliance rates in an economy; a society that is more corrupt enabling higher tax evasion because of corrupt officials; or higher levels of tax evasion aiding the growth of corruption by encouraging fraudulent activities. While a large body of work on the relationship between corruption and tax exists, the behavioural reasons for this correlation remains largely unexplored. This paper aims to determine how the prevalence of corruption in a society affects the tax evasion behaviour using the concepts of 'Psychic Cost of Tax Evasion'¹ and 'Intrinsic Honesty and the Prevalence of Rule Violations'². While the former claims that individual tax compliance behaviour is dependent of the psychological cost experienced when lying or cheating, the latter claims that in the presence of high prevalence of rule violations, individuals tend to be more dishonest. Building on these concepts, this paper studies whether the psychic cost of tax evasion is reduced when corruption is prevalent. This study develops a quantitative relationship between the Corruption Perceptions Index and the size of the shadow economy as a proxy for tax evasion for 12 countries, using an average of the data between 2005-2015. Applying Linear regressions demonstrate that corruption has a significant impact on tax evasion rates. These results indicate that the psychic cost of tax evasion is lower in the presence of corruption. Additionally, individual regressions for 7 high-income and 5 low-income countries show that tax evasion rates in high-income countries are more significantly affected by corruption than in low-income countries.

¹ Thomas, Kathleen Delaney. "the Psychic Cost of Tax Evasion." Boston College Law Review (2015).

² Gaetcher, Simon and Jonathan F. Schulz. "Intrinsic Honesty and the Prevalence of Rule Violations Across Societies." Nature (2016).

ABSTRACT

Korruption und Steuerhinterziehung stellen signifikante Probleme von Volkswirtschaften dar; obwohl es sich grundsätzlich um zwei gesonderte Sachverhalte handelt, sind diese verbunden und voneinander abhängig. Die Forschung zeigt, dass Korruption Auswirkungen auf die Steuerehrlichkeit einer Volkswirtschaft hat.

Ziel dieser Arbeit ist es mittels der Konzepte von „Psychic Cost of Tax Evasion“ und „Intrinsic Honesty and the Prevalence of Rule Violations“ estzustellen, wie das Vorliegen von Korruption sich auf Steuerhinterziehung auswirkt. Während Ersteres folgert, dass Steuerehrlichkeit das Ergebnis der psychologischen Kosten von Lüge und Betrug ist, ist für Letzteres individuelle Steuerhinterziehung das Ergebnis von allgemein häufig auftretenden Regelverstößen einer korrupten Gesellschaft.

Aufbauend auf diesen Konzepten untersucht diese Arbeit, ob sich die psychologischen Kosten von Steuerhinterziehung beim Vorherrschen von Korruption reduzieren. Diese Arbeit stellt eine quantitative Beziehung zwischen dem Corruption Perceptions Index und der Größe der Schattenwirtschaft als Vertreter für Steuerhinterziehung in 12 Länder von 2005–2015 her. Die Anwendung von linearer Regression zeigt, dass Korruption signifikante Auswirkungen auf Steuerhinterziehungsraten hat. Die Resultate indizieren, dass sich die psychologischen Kosten beim Vorliegen von Korruption reduzieren. Weiters sind die Auswirkungen beim Vorliegen von Korruption in Hochlohnländern größer als in ärmeren Ländern.

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Introduction

Corruption and tax evasion are seasoned issues in the never-ending list of problems that face today's economies. Both aspects are equally significant and are distinct issues affecting the economy, they are most often easily intertwined and simultaneously reinforce each other.

It is best to start by clarifying the terms to avoid misinterpretations. Governments are considered leviathan institutions in an economy, have a natural monopoly and also the power to control this monopoly. These institutions are responsible for providing public goods and services, and a selfless and impartial government would provide them efficiently at their marginal costs. However, being a leviathan institution, politicians and public officials are not entirely altruistic, and such officials may abuse their public position for personal gain. Many officials often demand bribes in exchange for paperwork such as licenses and contracts, granting favours such as subsidies to industries that provide monetary contribution to their political agendas, using public treasury finances for personal necessities, along with many other similar occurrences. Such actions are defined as an abuse of public office for private gain, or in other words, corruption³.

Tax evasion is a related but vastly different concept and refers to illegal and intentional actions taken by individuals to reduce and dodge their legally due tax obligations. There are various means by which individuals usually evade their taxes such as underreporting their income, by overstating their exemptions or the values of their deductions, purposely failing to file their tax returns, and so on. Most often, such actions are measured on an individual level by measuring the personal income tax, and in fact, most theoretical and empirical research on tax evasion has mostly been focused on the individual income tax.

Taxes have been an essential part of an economy, and researchers have been battling at the question of increasing tax compliance and also to understand the reasons that make people comply with their tax obligations. The most famous study on tax evasion is the expected utility theory, which states that tax evasion behaviour is solely dependent on the probability of detection and the penalties associated with detection. Then, according to this theory, most people should primarily evade their taxes as the monetary pay-off is higher with evasion than compliance. Contrary to this theory, in reality, compliance rates are much higher, making researchers question the reasons that lead to such high levels of compliance.

³ Shleifer, Andrei and Robert W. Vishny. "Corruption." *The Quarterly Journal of Economics* 108, no. 3 (1993): 559-617.

This paper tackles the same question of tax compliance but from the viewpoint of how corruption influences the levels of tax compliance. While a large body of work on each subject exists, the relationship between the two issues has remained uninvestigated area. While studying the interrelatedness on the two topics, I attempt to explore the effects the two topics have on each other by using concepts of social and personal norms within the area of behavioural economics.

The effects of norms on tax behaviour have been studied tremendously, and have been shown to positively and negatively influence tax compliance levels. Honesty is one such (personal) norm that has an impact on the decision to evade taxes, adding a “psychic cost” to tax evasion. However, what happens to this psychic cost when corruption enters the picture? I attempt to analyse this question using the results from Gaechter and Schulz’s research on the relationship between individual intrinsic honesty and the prevalence of rule violations. By constructing Prevalence of Rule Violation Indices for Brazil, Russia, India, China and South Africa (BRICS) as well as the G7 countries of Canada, France, Germany, Italy, Japan, United Kingdom and the United States, there is a range of economies with different levels of corruption in the sample pool.

The PRV results show an indication of the prevalence of rule violations, and this is further tested using the results of the die-in-cup experiment employed by Gaetcher and Schulz. The experiment conducted in 23 countries gives the results generalisability, which state that countries with a high PRV value have a high prevalence of rule violations and individuals from these countries are more likely to be dishonest and justify their dishonesty with the prevalence of it in society. On the other hand, low PRV countries have few rates of dishonesty and even have entirely honest individuals.

Their study and experiment help further my research to understand the effect of corruption on tax compliance behaviour. A comparative analysis is done using Transparency International’s Corruption Perceptions Index and the size of the shadow economy as a proxy for tax evasion rates.

The next section discusses the existing literature on tax compliance, both economic and behavioural, as well as corruption, its effects on tax compliance, and how the shadow economy is related to corruption. Section II outlines the essential theories used to support the research, and Section III describes the methodology in detail, including results. The results are discussed in detail in Section IV, and Section V presents a summary and the conclusion.

I. Theories of Tax Compliance

As mentioned earlier, economists have been increasingly studying the reasons for individual tax evasion, and also the reasons for tax compliance. Current tax compliance theories in most of the countries are based on the standard deterrence model of tax compliance, but this model fails to solve the puzzle of the increasing level of compliance. This part of the paper will study the past literature that is relevant to tax compliance and evasion and includes research when are mainly extensions on the standard deterrence model, both economic and non-economic extensions. This section will also cover recent literature on the effects of government corruption on tax compliance.

A. Economic Models

The Allingham-Sandmo⁴ Model of tax evasion is called the expected utility model, the standard deterrence model and also the rational actor model. It is based on the famous *economics of crime model* developed by Becker (1968)⁵ and Srinivasan (1973)⁶. The expected utility model, here on the A-S model, analyses the individual taxpayers' decision of whether and to what extent to avoid taxes by deliberate underreporting.⁷ The standard deterrence model applied to tax compliance assumes that taxpayers are rational actors seeking to maximise their expected utility⁸. With the simplification of the costs of tax evasion, the model ignores other determinants of tax evasion, and accordingly has two options, to declare the full income or less than the actual income. The taxpayer will weigh the expected cost of tax evasion against the cost of complying and choose the cheaper option. The model is based on the following assumptions, actual income (W) which is unknown to the authorities, a certain tax rate (r), the income declared by the taxpayer (X). The cost of compliance is simply the tax on the actual income. However, the cost of evasion includes an audit probability (p) and a penalty rate (f) which is a fine levied on the

⁴ Allingham, Michael G. and Agnar Sandmo. "Income Tax Evasion: A Theoretical Analysis." *Journal of Public Economics* 1, (1972): 323-338.

⁵ Becker, Gary S. "Crime and Punishment: An Economic Approach." *Journal of Political Economy* 76, no. 2 (03/01; 2019/01, 1968): 169-217.

⁶ Srinivasan, T. "Tax Evasion: A Model." *Journal of Public Economics* no. 4 (1973): 339-346.

⁷ Ibid.

⁸ Dhimi, Sanjit and Ali al-Nowaihi. "Why do People Pay Taxes? Prospect Theory Versus Expected Utility Theory." *Journal of Economic Behavior & Organization* 64, no. 1 (2007): 171-192.

undeclared income, a fraction of the tax owed. The expected cost of tax evasion is the total penalty cost (f) times the probability of audit (p) (detection):

$$\text{Cost of compliance} = \text{Total tax owed}^9$$

$$\text{Cost of evasion} = p * f(W-X)^{10}$$

The A-S model predicts that the expected utility of tax evasion is:

$$E[U] = (1-p) U(W-rX) + pU(W-rX-f(W-X))^{11}$$

The result of the model is that an increase in the penalty rate will always increase the fraction of actual income declared, and an increase in the probability of detection will always lead to a more significant income being declared.¹² Therefore, tax evasion can be reduced since the standard by raising the penalty rates or increasing the frequency of audits. Yitzhaki introduces changes to this model in order to make it more realistic, the penalty of an uncovered tax evader now calculated as a share of the evaded tax (y)¹³, rather than a levy on undeclared income^{14, 15}.

Many researchers have studied the A-S-Y¹⁶ model with extensions, where elements have been added to the model to make it more realistic concerning tax compliance and evasion behaviour. Since the standard expected utility theory concludes that enforcement is the main factor that drives compliance, researchers have studied factors such as employer withholding¹⁷; strategies for reporting on taxes¹⁸; audit selection rules¹⁹; public goods provided for tax payments²⁰ and many other components²¹ that could explain the tax

⁹ Total tax owed is derived from the actual income $\rightarrow W * r$

¹⁰ Total income – declared income = undeclared income * penalty rate

¹¹ Ibid.

¹² a-s

¹³ $y = r(W-X)$

¹⁴ Cost of evasion = $p * f(y)$

¹⁵ Yitzhaki, Shlomo. "A Note on 'Income Tax Evasion: A Theoretical Analysis'." *Journal of Public Economics* no. 4 (1974): 201-202.

¹⁶ For Yitzhaki's contribution to the A-S model.

¹⁷ Alm, James, Jeremy Clark, and Kara Leibel. "Enforcement, Socioeconomic Diversity, and Tax Filing Compliance in the United States." *Southern Economic Journal* (2016).

¹⁸ Martinez-Vazquez, Jorge and Mark Rider. "Fiscal Decentralization and Economic Growth: A Comparative Study of China and India." *Indian Journal of Economics & Business, Special Issue China & India* (2006).

¹⁹ Kuchumova, Yulia (Paramonova). "A Collateral Tax Sanction: When does it Mimic a Welfare-Improving Tag?." *HSE Working Papers* (2017).

²⁰ Cowell, Frank A. and James P. F. Gordon. "Unwillingness to Pay: Tax Evasion and Public Good Provision." *Journal of Public Economics* 36, no. 3 (1988): 305-321.

²¹ For a comprehensive summary of the factors considered, see Andreoni, James, Brian Erard, and Jonathan Feinstein. "Tax Compliance." *Journal of Economic Literature* 36, no. 2 (1998): 818-860, and Alm, James. "what

compliance puzzle. Although these extensions add other layers of factors that might influence tax compliance behaviour and bring the predictions closer to the actual compliance levels, they still use enforcement as the factor that motivates tax compliance.²² Apart from this, the model has been criticised in for several reasons²³: when tested with realistic penalty rates, tax rate and the probability of detection, the model suggests complete tax evasion, given the individual is rational.²⁴ Empirical evidence shows that an increase in the penalty rate is perceived as unfair²⁵, resulting in lower tax compliance. Increasing the probability of detection is another method suggested by the model, however, Individuals perceptions of the probability of audit influence their behaviour²⁶, and individuals generally perceive their audit probability to be substantially higher than the audit rates that apply to them, again resulting in higher compliance rates.²⁷ Therefore, research concludes that compliance decisions of individuals must be affected by other factors or affected in ways that are not captured by the standard deterrence model, as it does not take psychological effects and moral considerations into account.²⁸

B. Behavioural Models

The main problem observed with the expected utility theory analysis of tax evasion is that it vastly over-predicts the extent of tax evasion.²⁹ Although it is clear that detection and punishment affect compliance to a certain degree, only the consideration of enforcement mechanisms does not help explain the factors that motivate tax compliance behaviours.³⁰ Behavioural models of tax compliance do not disregard the A-S model, instead provide further extensions to the theory, with aspects of behaviour studied under other social sciences such as psychology and sociology. Within behavioural economics, the standard

Motivates Tax Compliance?." *Journal of Economic Surveys* (2018).

²² Ibid.,4.

²³ This list is non-inclusive.

²⁴ Hashimzade, Nigar, Gareth D. Myles, and Binh Tran-Nam. "Applications of Behavioural Economics to Tax Evasion." *Journal of Economic Surveys* 27, no. 5 (2012).

²⁵ Ibid.

²⁶ Sandmo, Agnar. "the Theory of Tax Evasion: A Retrospective View." *National Tax Journal* 58, no. 4 (2005): 653-663.

²⁷ Kirchler, Erich. *the Economic Psychology of Tax Behaviour* Cambridge University Press, 2007

²⁸ Bosco, Luigi and Luigi Mittone. "Tax Evasion and Moral Constraints: Some Experimental Evidence." *Kyklos* 50, no. 3 (1997): 297-324

²⁹ Dhami., 3.

³⁰ Alm, James. "Why do People Pay Taxes?." *Journal of Public Economics* 48, no. 1 (1992): 21-38.

neoclassical economic model of rational, self-controlled, self-interested human behaviour is replaced with human behaviour which includes certain deviations which are classified into three categories: imperfect optimisation, bounded self-control and non-standard preferences.³¹ Many researchers have identified behavioural factors that play an additional, important role in tax compliance, such as the influence of prospect theory³², how decision depends on the way risk information is presented and how preferences are expressed³³, that individuals overweigh probabilities³⁴, personal contributions are dependent on the contributions of others³⁵ and not only interaction with others affect contributions, but also the interaction with tax authorities matters for honest declaration behaviour³⁶, and the like³⁷.

This paper considers behavioural economic theory relating to individual norms and social norms since they have a significant impact on tax compliance decisions³⁸.

a. Social Norms

Several scholars have attributed tax compliance behaviours to social norms. In a study by Alm, McClelland and Schulze (1999)³⁹, social norms had a significant impact on compliance behaviour as participants who learned that the majority rejected a more strict enforcement showed subsequently lower levels of compliance, meaning that if there is a social norm of tax compliance, an individual will comply if the others in the society are complying. A social norm represents a pattern of behaviours that are judged similarly by others, and that is sustained in part by social approval or disapproval⁴⁰. Adherence to social norms generally describes a desire to reciprocate the ethical behaviour of others or to send

³¹ Congdon, William J., Jeffrey R. Kling, and Sendhil Mullainathan. Policy and Choice Brookings Institution Press, 2011

³² Dhami., 3.

³³ Casey, Jeff T. and John T. Scholz. "Beyond Deterrence: Behavioral Decision Theory and Tax Compliance." *Law & Society Review* 25, no. 4 (1991): 821-844.

³⁴ Halpern, David. *Inside the Nudge Unit* WH Allen, 2015

³⁵ Frey, Bruno and Benno Torgler. "Tax Morale and Conditional Cooperation." *Journal of Comparative Economics* 35, no. 1 (2007): 136-159.

³⁶ Feld, Lars P. and Bruno Frey. "Tax Compliance as the Result of a Psychological Tax Contract: The Role of Incentives and Responsive Regulation." *Institute for Empirical Research in Economics - University of Zurich* (2006)

³⁷ See Hashimzade et al. (2012) for more behavioural factors that affect tax compliance.

³⁸ Ibid.

³⁹ Alm, James, Gary H. McClelland, and William D. Schulze. "Changing the Social Norm of Tax Compliance by Voting " *Kyklos* 52, no. 2 (1999).

⁴⁰ Elster, Jon. "Social Norms and Economic Theory." *The Journal of Economic Perspectives* 3, no. 4 (1989).

a positive signal to others⁴¹. But, in a study conducted by Wenzel (2004), the data showed that social norms had no simple relationship to self-reported tax compliance, complying with past theoretical evidence showing that personal norms, in the sense of individually held ethical views about taxpaying, had a significant and substantial effect on self-reported tax compliance⁴². Using the self-categorisation theory, he proved that social norms of one's group are attributed to oneself and internalised as authentic aspects of one's social self, meaning that social norms only play a significant role when they are internalised and have an effect on compliance levels when one identifies with a social group.

b. Personal Norms

Various studies have demonstrated the role of personal norms that influence taxpayer behaviour, such as appealing to the taxpayer's conscience could increase their tax compliance, that is, moral appeal has a peripheral effect on the attitudes towards and behaviours of taxpaying⁴³. There are also several studies showing that honesty⁴⁴, ethical considerations⁴⁵, and also the anticipated guilt with non-compliance⁴⁶ are significantly related to tax compliance. Another study focused on studying the effects of legal punishment, social stigma and guilt on tax compliance found stronger effects for guilt than the other two threats⁴⁷. Many other studies produced similar findings of personalised norms, increasing the propensity of tax compliance⁴⁸.

Personal tax norms are undoubtedly in no small part based on processes of social learning and other environmental factors⁴⁹ and therefore, personal norms are not understood as

⁴¹ Posner, Eric. "Law and the Emotions." U Chicago Law & Economics, Olin Working Paper no. 103 (2000).

⁴² Wenzel, Michael. "An Analysis of Norm Processes in Tax Compliance." *Journal of Economic Psychology* 25, (2004).

⁴³ Schwartz, Richard D. and Sonya Orleans. "On Legal Sanctions." *University of Chicago Law Review* 34, no. 2 (1967). McGraw, Kathleen M. and John T. Scholz. "Appeals to Civic Virtue Versus Attention to Self-Interest: Effects on Tax Compliance." *Law & Society Review* 25, no. 3 (1991).

⁴⁴ Porcano, Thomas M. "Correlates of Tax Evasion." *Journal of Economic Psychology* 9, no. 1 (1988): 47-67.

⁴⁵ Reckers, Philip M. J., Debra L. Sanders, and Stephen J. Roark. "the Influence of Ethical Attitudes on Taxpayer Compliance." *National Tax Journal* 47, no. 4 (1994).

⁴⁶ Grasmick, Harold G. and Robert J. Bursik Jr. "Conscience, Significant Others, and Rational Choice: Extending the Deterrence Model" *Law & Society Review* 24, no. 3 (1990).

⁴⁷ Grasmick, Harold G. and Wilbur J. Scott. "Tax Evasion and Mechanisms of Social Control: A Comparison with Grand and Petty Theft." *Journal of Economic Psychology* 2, no. 3 (1982).

⁴⁸ Bosco and Mittone, 5.

⁴⁹ Elffers, Henk, Russell H. Weigel, and Dick J. Hessing. "the Consequences of Different Strategies for Measuring Tax Evasion Behavior." *Journal of Economic Psychology*, 1987, Vol. 8, Issue 3, 311-337 8, no. 3 (1987): 311-337.

personal characteristics because of the influence of societies, and are dependent on and vary with the groups and social norms an individual refers to⁵⁰. Therefore, personal and social norms cannot be viewed as entirely independent of each other, as seen from the study conducted by Wenzel (2004). However, what must be noted is that, although there is internalisation of social norms, studies show that violation of personal norms arouses feelings of guilt and discomfort, which are stronger than feelings of embarrassment arising from breaking social norms⁵¹. Intrinsic motivation, that is, personal norms have a more significant impact on tax compliance, because even if people know their neighbours are not paying taxes⁵², they choose not to cheat because then they would be defying their personal norms.

C. Corruption

Corruption is a social disease, an injustice that plagues many developing countries today. It is a complex, social, political and economic phenomenon that is prevalent in all countries in varying degrees. There is no worldwide agreement on the meaning of corruption. The vital role of the state is apparent in most definitions of corruption, which define corruption as a particular (and perverted) state-society relation. As the intense debate over definition demonstrates, corruption refers to a broad range of behaviour. Corruption is conventionally understood, and referred to, as the private wealth-seeking behaviour of someone who represents the state and the public authority. It is the misuse or abuse of public office for private gains/benefits⁵³, this widely adopted definition has been criticised for being culturally biased and excessively narrow⁵⁴. Another widely used description is that corruption is a transaction between private and public sector actors through which collective goods are illegitimately converted into private-regarding payoffs^{55 56}.

50 Terry, Deborah J., Michael A. Hogg, and Katherine M. White. "Attitude-behavior Relations: Social Identity and Group Membership." *Applied Social Research. Attitudes, Behavior, and Social Context: The Role of Norms and Group Membership* (2000)

⁵¹ Erard, Brian and Jonathan Feinstein. "Honesty and Evasion in the Tax Compliance Game." *The RAND Journal of Economics* 25, no. 1 (1994). Ibid.

⁵² Alm, James, Kim M. Bloomquist, and Michael McKee. "When You Know Your Neighbour Pays Taxes: Information, Peer Effects and Tax Compliance." *The Journal of Applied Economics* 38, no. 4 (2016).

⁵³ Vargas- Hernandez, Jose G. "The Multiple Faces of Corruption: Typology, Forms and Levels" (2009)

⁵⁴ Rohwer, Anja. "Measuring Corruption: A Comparison between the Transparency International's Corruption Perceptions Index and the World Bank's Worldwide Governance Indicators" *Leibniz -Institut für Wirtschaftsforschung an der Universität München* 7, no.3 (2009).

⁵⁵ Heidenheimer, Arnold J., Michael Johnston and Victor T. LeVine. "Political Corruption: A Handbook" (1989)

⁵⁶ Rose-Ackerman, Susan. "Corruption: A study in Political Economy" (1978)

Most understand corruption as a form of bribery, where illegal payments to a government official in return for some official, authoritative act that has a selective impact and that in the absence of this secret transaction would not otherwise have been made⁵⁷. Beyond bribery, corruption also includes kickback payments, and extortions, where public power is misused to induce a bribe. Although commonly understood only as a transaction between an individual and the state, corruption also includes activities such as embezzlement which is the diversion of public funds for personal use by policy-makers⁵⁸.

Andvig et al.⁵⁹ outline four primary forms or manifestations of corruption in their research. Bribery, embezzlement, fraud and extorting are concepts that are partly overlapping and interchangeable with other concepts, but they identify some primary varieties of corruption⁶⁰.

Bribery is the payment (monetary or non-monetary) that is given or taken in an illegal transaction. Bribery is equivalent to kickbacks, commercial arrangements or pay-offs. These are all notions of corruption in terms of the money or favour paid to the employees in private enterprises, public officials and politicians. They are payments required or demanded to lighten the burden of bureaucracy or to make bureaucratic necessities provide favourable outcomes.

Embezzlement is the illegal acquisition of resources by people who are responsible for administering them, such as when politicians use tax revenue for private purposes or hide away government revenue in off-shore bank accounts. Embezzlement, although not considered corruption from a legal point of view, it falls within the broader definition of corruption. Since embezzlement deprives the general public of the public funds, it is considered a form of power abuse and is a fundamental part of the resource extractive capacity⁶¹ of the government or ruling party in many corrupt economies.

Fraud is an economic crime that involves deception or scam. It is the manipulation or distortion of information, facts and expertise by public officials for their own profit.

Extortion is resources, monetary or in kind, extracted by the use of intimidation, violence or terrorisation to use force.

⁵⁷ Johnston, Michael. "Syndromes of Corruption: Wealth, Power and Democracy" Cambridge University Press (2005).

⁵⁸ Morris, Stephen D. "Forms of Corruption" Leibniz -Institut für Wirtschaftsforschung an der Universität München, 9 no. 2 (2011).

⁵⁹ Andvig, Jens Chr, Add-Helge Fjeldstad, Inge Amundsen, Tone Sissener and Tine Søreide. "Research on Corruption. A policy oriented survey" (2000)

⁶⁰ Ibid.

⁶¹ Ibid., 10.

Corruption is also differentiated by dividing corruption into petty and grand corruption. Petty corruption is street-level, everyday corruption. It occurs when people interact with low-to mid-level public officials in familiar places such as hospitals, schools, police departments and other bureaucratic agencies. Transactions occur on a small scale and mainly only impacts individuals involved in the transaction. Grand corruption, on the other hand, takes place at a higher level in the government, such as the policy-making departments. Although monetary transactions are part of the illegality, it refers more to the level at which the corruption occurs⁶².

a. Corruption and Tax Compliance

Corruption is a huge issue that affects the economic well-being of the economy and government revenue, often misused due to corruption and is obtained mainly through tax payments. The previous sections presented the economic theories of tax evasion, which relied on assumptions of expected utility theory, and also an account of the various behavioural economic concepts and their application to the field of tax compliance, particularly social and personal norms.

Many papers have studied the direct influence of corruption on revenue of an economy, and most find a negative relationship between corruption and tax revenue, primarily influenced by the way corruption interacts with tax compliance. Declarations of taxable income increasingly depend on voluntary compliance by the taxpayers⁶³. In a study, a negative correlation between corruption between and the tax-to-GDP ratio was found, attributed to corrupt systems of government that face resistance to increasing taxes. The authors provide theoretical arguments of how corruption can be an obstacle to the emergence of tax compliance norms in developing countries and thus, they prove a reason as to why developing nations have lower tax revenue⁶⁴. Compliance rates are seen to decrease because corruption discourages people and affect the perceived unfairness in the exchange between taxpayers and the state⁶⁵. Widespread corruption harms the culture of

⁶² Rohwer, Anja. "Measuring Corruption: A Comparison between the Transparency International's Corruption Perceptions Index and the World Bank's Worldwide Governance Indicators" Leibniz -Institut für Wirtschaftsforschung an der Universität München 7, no.3 (2009).

⁶³ Kirchler, Erich, Erik Hoelzl, and Ingrid Wahl. "Enforced Versus Voluntary Tax Compliance: The "Slippery Slope" Framework." *Journal of Economic Psychology* 29, no. 2 (2008).

⁶⁴ Besley, Timothy and Torsten Persson. "Why do Developing Countries Tax so Little?." *Journal of Economic Perspectives* 28, no. 4 (2014).

⁶⁵ Feld, 6.

compliance, thereby increasing evasion⁶⁶ since countries with high levels of corruption lack the social norm of paying taxes to the government⁶⁷. Corruption, therefore, fosters the development of an informal sector⁶⁸ with aspects of corruption such as bribery distorting the price mechanism and eroding government legitimacy⁶⁹. Studies suggest that indirect taxes requiring frequent interactions between tax authorities and individuals are more prone to corruption⁷⁰, and one reason for this is that tax officials are in a position to extort bribes, collude with taxpayers and embezzle public revenues⁷¹. In a recent study by the IMF, the researchers check if the negative correlation between corruption and tax revenues varies between high corruption and low corruption countries. They found that the adverse effect of corruption on tax collection is larger in advanced economies⁷². Within the same study, they concluded that the effect of corruption on revenue performance is mediated through poor compliance behaviour⁷³. Alm et al 2016 study the relationship between corruption and firm tax evasion, finding more evidence that corruption of tax officials is a statistically and economically significant determinant of tax evasion⁷⁴. In another study, Cameral et al (2009) analyse corruption behaviour and attitudes of students from low-corruption countries and high-corruption countries. They find that students from countries where corruption was more highly prevalent harboured more tolerant attitudes towards corruption. In a study closer to the research area of this paper, researchers studied the effects of petty corruption on the tax morale in 29 Sub-Saharan countries in Africa, finding that petty corruption payments significantly reduce tax morale of the citizens⁷⁵. The results indicated

⁶⁶ Aghion, Philippe, Ufuk Akcigit, Antonin Bergeaud, Richard Blundell, and David Hemous. "Innovation and Top Income Inequality " (2016).

⁶⁷ Torgler, Benno. "the Importance of Faith: Tax Morale and Religiosity." *Journal of Economic Behavior & Organization* 61, no. 1 (2006).

⁶⁸ Schneider, Friedrich. "Shadow Economies Around the World: What do we really Know?." *European Journal of Political Economy* 21, no. 3 (2005).

⁶⁹ Ibid.

⁷⁰ Attila, Gbewopo. " Corruption and Quality of Public Institutions: Evidence from Generalized Method of Moment " HAL Archives (2008).

⁷¹ Ibid.

⁷² Baum, Anja, Sanjeev Gupta, Elijah Kimani, and Sampawende Jules Tapsoba. "Corruption, Taxes and Compliance." IMF Working Paper (2017).

⁷³ Ibid.

⁷⁴ Alm, James, Jorge Martinez-Vazquez, and Chandler McClellan. "Corruption and Firm Tax Evasion." *International Center for Public Policy Working Paper Series. Paper 2.* (2014).

⁷⁵ Jahnke, Bjorn and Reinhard A. Weisser. "How does Petty Corruption Affect Tax Morale in Sub-Saharan Africa?" *European Journal of Political Economy* (2018): 1-17.

that well-informed individuals, mainly, who lived in an environment characterised by immediate levels of petty corruption, were more prone to evade their taxes⁷⁶.

b. The Shadow Economy and Tax Evasion

The underground economy is an inescapable feature of countries throughout the world. Various factors drive businesses and other economic transaction to operate in the unofficial economy. Such operations enable firms to evade taxes and regulations, although they must weight these benefits against the potential costs of detection and punishment associated with breaking the law. The effects of the shadow economy can be significant and far-reaching as scarce resources are wasted or used inefficiently, regulations are circumvented and undermined, the national accounted are negatively affected, and public finances reduced significantly⁷⁷. The shadow economy is, by nature, difficult to measure, as agents engaged in shadow economy activities try to remain undetected. Information about the extent of the shadow economy, who are engaged, the frequency of these activities and their magnitude is crucial for making effective and efficient decisions regarding the allocation of a country's resources⁷⁸. Researchers attempting to measure the size of this informal economy are continually trying to find the right definition. One of the broadest definitions commonly used includes "those economic activities and the income derived from them that circumvent government regulation, taxation or observation"⁷⁹. Schneider and Buehn⁸⁰ define the shadow economy as that includes all market-based legal production of goods and services that are deliberately concealed from public authorities for the following purposes: (1) to avoid payment of taxes, e.g. income taxes or value-added taxes, (2) to avoid payment of social security contributions, (3) to avoid specific legal labour market standards, such as minimum wages, maximum working hours, etc. and (4) to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms. The relationship between corruption and the shadow economy is quite blurred and are considered as a form of complements or

⁷⁶ Ibid.

⁷⁷ Blackburn, Keith, Niloy Bose and Salvatore Capasso. "Tax evasion, the underground economy and financial development" *Journal of Economic Behaviour and Organisation* 83, (2012)

⁷⁸ Buehn, Andreas and Freidrich Schneider. "Show economies around the world: novel insights, accepted knowledge, and new estimates" *International Tax Public Finance* (2012)

⁷⁹ Del'Anno and Schneider 2004

⁸⁰ Schneider, Friedrich and Andreas Buehn. "Estimating the Size of the Shadow Economy: Methods, Problems and Open Questions" (2016)

substitutes⁸¹. Researchers have found that corruption positively affects the size of the informal economy, as corruption or red tape is a form of extra taxation burden that drives businesses and other economic activities to go underground⁸². However, the relationship between corruption and the underground economy in high income, that is, developed countries might differ from that in developing or underdeveloped countries. Schneider found that corruption in higher income countries or developed countries significantly reduces the size of the shadow economy while in low-income countries, the size of the shadow economy tends to increase with corruption⁸³. In high-income countries, the official sector provides public goods and only craftsmen, or very small firms have the option of going underground. Generally developed countries have low corruption rates, and an instance of fraudulent activity is most likely to be reported. One reason is that, in a high-income country, corruption often takes place to win a contract for a large public sector project; therefore the money from the shadow economy tends to go back into the official system⁸⁴.

On the other hand, in low-income developing and under-developed countries, certain businesses work entirely in the unofficial economy. Corruption often takes place in order to pay for the smooth running of activities in the shadow economy. Corruption is needed for the expansion of the shadow economy and public officials also engage in accepting bribes, furthering the growth of both corruption and the shadow economy⁸⁵. Although a direct relationship between the size of the shadow economy and tax evasion is unobservable, as long as taxes exist, some people will choose to hide their actions and avoid paying their taxes. Activities in the shadow economy often imply the evasion of direct and indirect taxes, so the factors affecting tax evasion will also affect the shadow economy⁸⁶.

II. Theoretical Framework

The specific effects of corruption on individual behaviour have always been discussed and studied within the literature on social norms. Given that previous literature has made it

⁸¹ Dreher and Schneider

⁸² Johnson 1998

⁸³ Schneider, Friedrich. "Shadow Economies and Corruption all over the World: New Estimates for 145 Countries" (2007)

⁸⁴ Ibid.

⁸⁵ Ibid.

⁸⁶ Schneider, Friedrich and Andreas Buehn. "Shadow Economies in Highly Developed OECD Countries: What are the Driving Forces?". IZA Discussion Paper (2012)

evident that personal norms have more power over compliance behaviour, that corruption is pervasive in many countries and related to reduce the levels of tax compliance, it is still an open question how individual behaviour/norms toward government corruption justify their dishonest decision to evade on taxes. From the previous section, research has outlined a significant positive relationship between corruption and the size of the shadow economy in low income countries. Although there have been several studies that link corruption to high levels of tax evasion, there has not been a behavioural approach to understand why individuals think non-compliance is justified.

Using the theories developed by Thomson and Gaetcher and Schulz, my research aims to determine whether the psychological discomfort or stress that affects individuals when lying or cheating is reduced when corruption is prevalent.

A. Psychic Cost of Tax Evasion⁸⁷

In her research, Thomas studies another means by which governments can improve tax compliance apart from raising the financial costs of tax evasion as suggested by the traditional Allingham and Sandmo model based on expected utility theory. As it is not necessarily cost effective from the government's perspective to increase the frequency of audits or increase the penalty rate, she introduces a "psychic cost" of tax evasion. This "psychic cost" draws heavily on the fact that previous literature concerning tax and personal ethics have ignored one crucial element: individual honesty is a malleable trait, one that is influenced heavily by environmental factors. Tax evasion is a form of cheating and the fact that guilt might deter people from cheating is apparent from previous research. The expected utility (financial benefit) derived from cheating (tax evasion) is not the sole factor in the decision to be honest, several non-economic, or "behavioural" factors influence the decision to be honest. The paper identifies three of these factors: moral standards, categorisation and the presence of a victim. The core argument of the paper is that governments should raise the psychic cost of tax evasion by employing subtle behavioural nudges that encourage taxpayers to be more honest. A model, based on the standard deterrence model is constructed, which includes a new element, the psychic cost of tax evasion:

$$\text{Cost of Compliance} = \text{Tax Owed}$$

⁸⁷ Thomas, Kathleen Delaney. "the Psychic Cost of Tax Evasion." Boston College Law Review (2015).

$$\text{Expected Cost of Evasion} = (P \times F) + Z^{88}$$

The effects of the factors that influence honesty are measured against the psychic cost, with moral standards and the presence of a victim increasing the psychic cost (leading to less evasion), while categorisation has a negative effect on the psychic cost.

Since tax evasion is a form of dishonesty or cheating, individuals experience a high psychic cost which prevents them from evading/cheating on their taxes.

B. Intrinsic Honesty and the Prevalence of Rule Violations

Continuing with the concept of honesty, Gaechter and Schulz conducted cross-societal experiments across 23 countries which demonstrate a robust link between the prevalence of rule violations and intrinsic honesty⁸⁹.

Facts derived from previous literature form the basis of their research into intrinsic honesty:

- A well-functioning society requires citizens' intrinsic honesty since institutions constructed to limit cheating and rule violations cannot control all situations that allow for cheating.
- Cultural characteristics, that is, the prevalence of rule violations also influences how individualist or collectivist a society is due to differences in the perceived scope of moral responsibilities.
- Literature from the fields of psychology, sociology and economic theories suggest causal pathways of how widespread practices of violating rules can affect individual honesty and the intrinsic willingness to follow rules.
- People might view dishonesty in everyday affairs without risking their self-concept of being honest, if cheating is quite common in the society they are part of and mainly if this cheating goes unpunished.
- Citizens' honesty might suffer when corruption is fostered in more extensive parts of society, especially if politicians set bad examples through fraudulent activities.
- The size of the shadow economy has an impact on the level of cheating since this indicates the levels of tax evasion.

⁸⁸ Where P is the probability of an audit, F is the total fines paid on the tax evaded (tax due + penalty due) and Z is the psychic cost, which the model assumes that the taxpayer incurs regardless of whether they are caught.

⁸⁹ Gaechter, Simon and Jonathan F. Schulz. "Intrinsic Honesty and the Prevalence of Rule Violations Across Societies." *Nature* (2016).

- When corruption is part of the culture, parents might encourage a positive attitude towards corruption and other acts of dishonesty.

These conclusions from previous studies help the researchers to construct an index of the ‘Prevalence of Rule Violations’ (PRV). By focussing on three broad types of rule violations, political fraud, tax evasion and corruption, they construct a PRV for 159 countries for the year 2003. They conduct comparable experiments in 23 diverse countries with a distribution of PRV which resembles the world distribution of PRV, the experimental tool to measure intrinsic honesty being the ‘die-in-a-cup’ task (explained in detail in Part III). The results of their study indicate that condition which supports the development of rule violations not only have adverse economic consequences but might also impair individual intrinsic honesty, that is, people benchmark their justifiable dishonesty with the extent of dishonesty they see in their societal environment.

The theory of a psychic cost of tax evasion explains that tax compliance rates are higher because people experience psychological discomfort when making dishonest decisions. On the other hand, Gaetcher and Schulz find that a high prevalence of rule violations in a society promotes more substantial sums of dishonest behaviour. Combining these two considerations, I study how high prevalence of corruption increases dishonest behaviour, which there would indicate a reduction in the psychic cost experienced during tax evasion.

Hypothesis: *Prevalence of corruption reduces the Psychic Cost of Tax Evasion, therefore increasing tax evasion rates.*

III. Methodology

Using the research of Thomson and Gaetcher and Schulz, the hypothesis is tested:

1. A PRV Index is created for the sample countries used in my research: BRICS (Brazil, Russia, India, China and South Africa) as the low-income country sample size; and G7 countries (Canada, France, Germany, Italy, Japan, United Kingdom and the United States) representing the high income economies of the world.
2. The PRV results are used as a reference for the levels of dishonesty in these economies/societies.

3. A correlation between the perception of corruption and the size of the shadow economies (as a proxy for the tax evasion rates) is studied using Linear Regression Analysis
4. The results of the correlation are compared to the PRV results to determine whether there is indeed a reduction in the psychic cost of tax evasion when there is a high prevalence of corruption.

A. Prevalence of Rule Violations (PRV)

From the literature mentioned above, we can conclude that cultural norms of behaviour influence desirable and problematic behaviours of individuals. In particular, social norms manifested as personal norms affect individuals' dishonesty. As mentioned earlier, Gaechter and Schulz⁹⁰ create a 'Prevalence of Rule Violations' (PRV) index, which they develop to measure the extent of society-wide practices of rule violations. The researchers use three broad but common types of rule violations present in most societies: political fraud, tax evasion and corruption.

To construct the PRV index, the researchers use three widely used country-level variables, data sources of which are comprehensive, and also representative of the prevalence of rule violations they wish to study. An indicator of political rights by Freedom House that measures the democratic quality of a country's political practices; the size of the country's shadow economy as a proxy for tax evasion; and corruption measured by the World Bank's Control of Corruption Index (Supplementary methods)⁹¹.

Adopting the same approach, I use the above data sources to construct a PRV of my own for a select number of countries for the year 2007. I focus my study on the BRICS countries (Brazil, Russia, India, China and South Africa) to measure the prevalence of rule violations in low-income countries. I also construct PRV for the G7 countries (Canada, France, Germany, Italy, Japan, UK and USA) to study how the prevalence of rule violations are comparable between the high-income and low-income countries. In the following part, I describe the method used to create the index and a brief explanation of the indicators used. The researchers use a die-in-cup experiment to conduct comparable experiments in 23 countries, with a distribution of PRV that is approximately representative of the world

⁹⁰ Gaechter, Simon and Jonathan F. Schulz, 17.

⁹¹ Ibid.

distribution of PRV. Due to experimental limitations, I use the results of their experiment, explained in detail in the following sections.

a. Control of Corruption⁹²

The World Bank Governance Indicators (WGI) reports aggregate and individual governance indicators for over 200 countries, with Control of Corruption being one of the six dimensions of governance. This indicator provides “perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as ‘capture’ of the state by elites and private interests”⁹³. In this view, corruption is considered a form of cheating, defying societal rules for personal and private benefit. It is a widely used aggregator based on 15 representative and non-representative sources, all of which is how corruption is perceived in the society by public and private sector participants, NGOs as well as citizens. The estimate gives a country’s score on an aggregate indicator, in units of a normal standard distribution, i.e. ranging from approximately -2.5 to 2.5. The country data set chosen for this study has a mean of 0.67.

b. The Shadow Economy⁹⁴

The shadow economy has different names, such as the hidden economy, grey economy, black economy or informal economy

The shadow economy is a market-based production of goods and services, deliberately concealed from official authorities for monetary, regulatory, and institutional reasons. The size of the shadow economy is a core input to the extent of tax evasion and thus for decisions on its adequate control⁹⁵. Gaetcher and Schulz use the size of the shadow economy estimated by Buehn and Schneider, based on monetary indicators (cash holdings), labour market indicators (labour market participation and growth rates) and the state of the official economy (GDP per capita and growth rates). The size of the shadow economy is measured as a percentage of the GDP. In 2007, the average country in the data set chosen for this study had a shadow economy of 19.83% of the GDP.

⁹² Retrieved from:

https://tcdata360.worldbank.org/indicators/hc153e067?country=BRA&indicator=364&viz=line_chart&years=1996,2017#table-link

⁹³ Ibid., 19.

⁹⁴ Buehn and Schneider., 11.

⁹⁵ Medina, Leandro and Friedrich Schneider. “Shadow Economies Around the World: What Did We Learn Over the Last 20 Years?” IMF Working Paper WP/18/17 (2018)

c. Political Rights⁹⁶

To capture the honesty of the political processes, the researchers use the ‘Political Rights’ scores from the Freedom in the World report produced by Freedom House. Freedom in the World is produced by a team of in-house consultants, and external analysts and expert advisers from the academic, think tank and human rights communities. ‘Political Rights’ scores are based on questions grouped in three sub-categories: (a) *Electoral process* focuses on free and fair elections and also on a fair electoral framework including meeting democratic standards. For example, underlying checklist questions ask whether the voting process took place by secret ballot system, whether the vote count was transparent, timely and the results honestly reported to the people; (b) *Political Pluralism and Participation* is focused on the freedom to form political parties without discrimination or domination from powerful parties, whether there is equal representation of all minorities within the political system. For example, the questions included particular enquiries into people’s choices being free from domination from political, military and foreign powers; (c) *Functioning of Government* is based on questions directed at transparency, corruption, and the ability of elected officials to determine the policies of the government. For example, the checklist questions ask whether safeguards against governmental corruption are in place and if corruption allegations are thoroughly investigated and prosecuted. In 2007, Freedom in the World reported Political Rights of countries ranging from 0 to 40 with higher scores referring to higher political rights. The country sample for this study ranges from 2 to 40, with a sample mean of 32.00, higher than the world average of 24 for 2007.

d. Prevalence of Rule Violations Index (PRV)

Gaetcher and Schulz found that the three variables, Control of Corruption, size of the Shadow Economy and Political Rights, which measure different but highly interrelated aspects of the prevalence of rule violations are highly correlated, and hence they adopted the method of Principal Component Analysis to extract the underlying component that drives these correlations. The main aim of the index is to capture the underlying dimensions of the prevalence of rule violations at the societal level, and hence the statistical tool of Principal Component Analysis is used. PCA is a dimension-reduction tool that is used to reduce a large set of variables to a small set that still contains most of the information of

⁹⁶ Retrieved from: <https://freedomhouse.org/report/freedom-world-aggregate-and-subcategory-scores>

the large set. It's a multivariate technique with the goal of extracting the important information from the data set, extracting the correlations between the variables and representing it as a set of new variables called principal components⁹⁷. Therefore, the purpose of the PCA in this study is to reduce the dimensionality of a data set with correlated variables down to the principal components that concisely summarise the data.

To perform the PCA and construct the PRV for the countries in my study, I use data from the indicators for the year 2007 for the BRICS and G7 countries. The year 2007 is the most recent year for which data for all three indicators are available. For the sample of the countries part of this study, PRV index has a mean 0.00 and a standard deviation of 1.47. The index of PRV ranges from -1.48 to 3.16 in my study. Higher values represent a higher prevalence of rule violations, with Canada having the lowest and Russia having the highest prevalence of rule violations according to this index. Although in my study, the sample is not representative of the world population, the sample pool was chosen to understand the difference in the relationship between corruption and tax compliance behaviour in high income and low-income countries.

B. Intrinsic honesty using Die-in-Cup Experiment⁹⁸

The experimental tool used to measure intrinsic honesty was the die-in-cup task. The participants, all nationals of their respective countries, sat in a cubicle and were asked to roll a six-sided die placed in an opaque cup twice, but to report the first roll only. The task of die rolling was unobservable by anyone except the participant. The researchers compensated the participants in money units, according to the number they reported on the die-roll: reporting a 1 earned 1 money unit, reporting a 2 received 2 money units, etc., except reporting a 6 earned zero money units. The experimenters made sure that the participants understood that the die-rolls reported were unverifiable. Across the different countries in their 23 country experiment sample, the value of the money units represented local purchasing power. Therefore, making certain that incentives in the experiment are the same for everyone, whether they live in high or low PRV environment.

Although the dishonesty of an individual is not precisely measurable, the aggregate scores of a group of society are indicative of honest or dishonest behaviours. All numbers in an

⁹⁷ Abdi, Hervé and Lynne J. Williams. "Principal Component Analysis." Encyclopedia of Biometrics (2009).

⁹⁸ Fischbacher, Urs and Föllmi-Heusi. "Lies in Disguise- An experimental study on cheating" Journal of the European Economic Association. (2013)

honest subject group occur with a probability of 1/6 and the average claim of these subjects is 2.5 money units. In a completely dishonest subject pool, Full Dishonesty⁹⁹ benchmark, the subjects go with the material incentives and claim the highest value of the money unit, which is 5 money units for rolling a 5 on the die.

Gaetcher and Schulz adopted the die-in-cup task as it requires only a simple non-strategic decision, and it allows for gradual dishonesty predicted by psychological theories of honesty. The pay-offs do not depend on the actions of other participants. As the lying of the participants can never be verified at an individual level, it gives a benchmark for dishonesty when reputational concerns are absent and the subjects are aware of this¹⁰⁰.

An experimentally tested theory of “justified ethicality” was applied to the setting, which argues that many people have a desire to maintain an honest self-image. Although reporting a false die roll risks this self-image, but bending the rules to report the higher of the two rolls could salvage the honest self-image. Therefore, Justified Dishonesty¹⁰¹ is an important benchmark for this study, according to which people will not report a number they actually did not roll, but they might bend the rules and report the better of the two rolls, rather than the first one as the rules stipulate. Reporting the better of the two rolls implies the Justified Dishonesty benchmark: claims of 0 should occur in $1/36 = 2.8\%$ of the cases (for rolls of 6-6); claims of 1 should occur $3/36 = 8.3\%$ (rolling 6-1, or 1-6, or 1-1); claims of 2, 3, 4 and 5 should occur 13.9%, 19.4%, and 30% of cases, respectively¹⁰².

Gaetcher and Schulz studied the implication of these patterns in terms of average claims and find that the average claim in high PRV countries is not significantly different from the Justified Dishonesty benchmark, but is significantly lower in low PRV countries. They look at four measures of dishonesty¹⁰³ derivable from results of the die-in-cup task and find that Mean Claim and PRV are strongly positively related. A second measure is the frequency of High Claims of 3, 4, 5, which was also found to be highly positively related to PRV. Maximising the incentives, that is to claim a 5, is the fourth measure which is not dependant on the society’s PRV level. The last measure of No Claim, which is when the subjects report a 6, indicates that in societies with high levels of PRV, fewer people are fully honest than in societies with low levels of PRV.

⁹⁹ Ibid., 17.

¹⁰⁰ Ibid.

¹⁰¹ Ibid., 23.

¹⁰² Ibid., 17.

¹⁰³ Ibid.

The researchers confirmed the robustness of their results by controlling for various measures such as socio-demographics. Government Effectiveness and other institutional and economic indicators. Various cultural indicators were also included, for example, the individualism or collectivism of a society. Individualist societies tend to have less corruption and consistent with this, the subject pools from individualist societies have lower claims than subject pools from collectivist societies¹⁰⁴. Their results suggest that institutions and cultural values influence the PRV, which in turn impact on people's intrinsic honesty and rule following, that is, '*people benchmark their justifiable dishonesty with the extent of dishonesty they see in their societal environment*'¹⁰⁵.

a. PRV Results

The results of Gaetcher and Schulz's die-in-cup task is generalizable¹⁰⁶ and hence, can be applied to understand how the prevalence of rule violations in the country sample of my research affects the intrinsic honesty of individuals.

Table 1 lists the countries and their corresponding PRV index I derived using the methodology laid out by the researchers.

The PRV in this study ranges from -1.48 to 3.16. As discussed earlier, higher values indicate a higher prevalence of rule violations, while low PRV is representative of lower levels of prevalence.

Applying the findings of Gaetcher and Schulz' experiment, we can see that Russia has the highest prevalence of rule violations and therefore, an individual in Russia is more likely to claim a higher value on the die-in-cup task. On the other hand, Canada, as an individualist society, has lower levels of corruption. This value also coincides with the PRV value obtained, which is the lowest in the sample pool. The other countries in the sample pool fall within the bracket, most of them closer to the lower PRV values of Canada rather than the high values of Russia.

These results help in furthering this study to the next step, which is to study tax compliance behaviours in the societies of the sample pool. Since the PRV indices show that certain countries have certain levels of rule violations and tax non-compliance or evasion is essentially a form of cheating or bending the rules for personal benefit, the results of the

¹⁰⁴ Gaetcher and Schulz, 17.

¹⁰⁵ Ibid.

¹⁰⁶ Ibid.

die-in-cup task are used as a reference for studying specifically if a corrupt society promotes further corrupt behaviour, especially tax non-compliance.

Country	Control of Corruption (CC)	Political Rights (PR)	Shadow Economy (SE)	PRV Value
Brazil	-0,08	31,00	36,60	1,40
Russia	-1,01	11,00	40,60	3,16
India	-0,40	34,00	20,70	0,65
China	-0,59	2,00	11,90	1,83
South Africa	0,25	36,00	25,20	0,37
Canada	2,00	40,00	15,30	-1,48
France	1,46	38,00	14,70	-1,06
Germany	1,74	39,00	15,30	-1,26
Italy	0,34	38,00	26,80	0,30
Japan	1,24	37,00	10,30	-1,10
United Kingdom	1,74	40,00	12,20	-1,47
United States	1,39	38,00	8,40	-1,34
Average	0,67	32,00	19,83	0,00
Standard Dev.	1,00	11,80	10,00	1,47

Table 1: PRV Index Results including Averages and Standard Deviation

C. PRV and Tax Compliance

The previous study shows us that intrinsic honesty is, in fact, related and dependent on the prevalence of rule violations in a society, and this is also observable in the PRV values. Using these results, I study if this assumption can also be used to understand if the level of corruption (rule violations) have an effect on the tax compliance rates in a given economy. The results of Gaetcher and Schultz's experiment can be interpreted in a way that if the prevalence of rule violations is high, ideally, the tax compliance rates should be low. I test this hypothesis using a measure of corruption, Corruption Perceptions Index (CPI) and the size of the shadow economy as a proxy for the rate of tax evasion. A high correlation between these two measures could indicate that the perception of corruption within an economy would affect the level of tax evasion. The sample pool is for the 12 countries listed: Brazil, Russia, India, China, South Africa, and the G7 countries, namely Canada, France, Germany, Italy, Japan, United Kingdom and the United States. The sample pool includes data from the years 2005 to the year 2015, and the average of each country within 10 years is used to study a correlation between the CPI Index and the size of the shadow economy. Linear regressions are created for the averages of the total country sample, low-income countries and high-income countries.

a. Corruptions Perception Index

Transparency International's Corruptions Perception Index (CPI) is a cross-country indicator of levels of corruption. The CPI ranks countries in terms of the degree to which corruption is perceived to exist among public officials and politicians. It is a composite index, a poll of polls, drawing on corruption related data from expert and business surveys carried out by a variety of independent and reputable institutions. The CPI reflects views from around the world. Including those of experts who are living in the countries evaluated, hence the index does not represent Transparency International's own valuation.

The CPI ranks countries on a zero to ten scale, with a score of zero representing very high corruption. The data for calculating the CPI is obtained from various resources; therefore, the scores gathered need to be standardised before being averaged into the Corruption Perceptions Index. The CPI measures corruption only in the public sectors, and as it is

perceived by experts only¹⁰⁷. The Index contains sources based on the assessments of foreigners and sources based on samples of nations. The observed divergence between the two groups perceptions are minimal, and hence “what counts as corruption in one part of the world is understood similarly elsewhere”¹⁰⁸. The CPI is considered the best-known measure of corruption in the world and a low ranking on the CPI has brought about the fall of the Bhutto Government in Pakistan, the Banzer Government in Bolivia and grounding the anti-corruption drive in many other countries¹⁰⁹. In this paper, I use the Corruption Perceptions Index retrieved from the Transparency International website¹¹⁰ for the sample pool countries for the years 2005 to 2015.

b. Shadow Economy/Tax Evasion

As mentioned earlier, the size of the shadow economy is a core input to estimate the extent of tax evasion¹¹¹. In this study, the size of the shadow economy is taken as a substitute for the rate of tax evasion, due to limitations in accessing governmental taxation statistics. The shadow economy has been described extensively in the previous sections of the paper and the sample country group chosen is to understand the negative relationship between corruption and the shadow economy in high-income countries and their positive relationship in low-income countries. The timeline for the size of the shadow economies, represented as a percentage of the GDP of the countries, observed is between 2005 and 2015. The data from a recent study by Medina and Schneider¹¹², in which various methods are tested and used together to create an overall value of the size of shadow economies around the world. The study includes a calculation of the size of the shadow economy from 1991 to 2015. The sample pool in this study is for the years 2005 to 2015.

c. Corruption and Tax Evasion Results

In *Tables (i) and (ii)*, the estimation results from the Corruption Perceptions Index and the size of the shadow economy are shown (see Supplementary Information). The averages of these estimates over 10 years (2005-2015) are then used to formulate the linear regressions

¹⁰⁷ De Maria, William. “Measurements and markets: deconstructing the corruption perception index” *International Journal of Public Sector Management*, 21, no. 7. (2008).

¹⁰⁸ Galtung, Frederik. “Measuring the Immeasurable: Boundaries and Functions of (Macro) Corruption Indices” (2006).

¹⁰⁹ Ibid.

¹¹⁰ Retrieved from: <https://www.transparency.org/research/cpi/overview>

¹¹¹ Ibid., 21.

¹¹² Ibid.

of the total sample countries, the low-income economies and the high-income economies respectively (*Table (iii)* Supplementary Information).

The main observations for each of the linear regressions are presented below, along with the regression statistics and interpretations are continued in the discussions section.

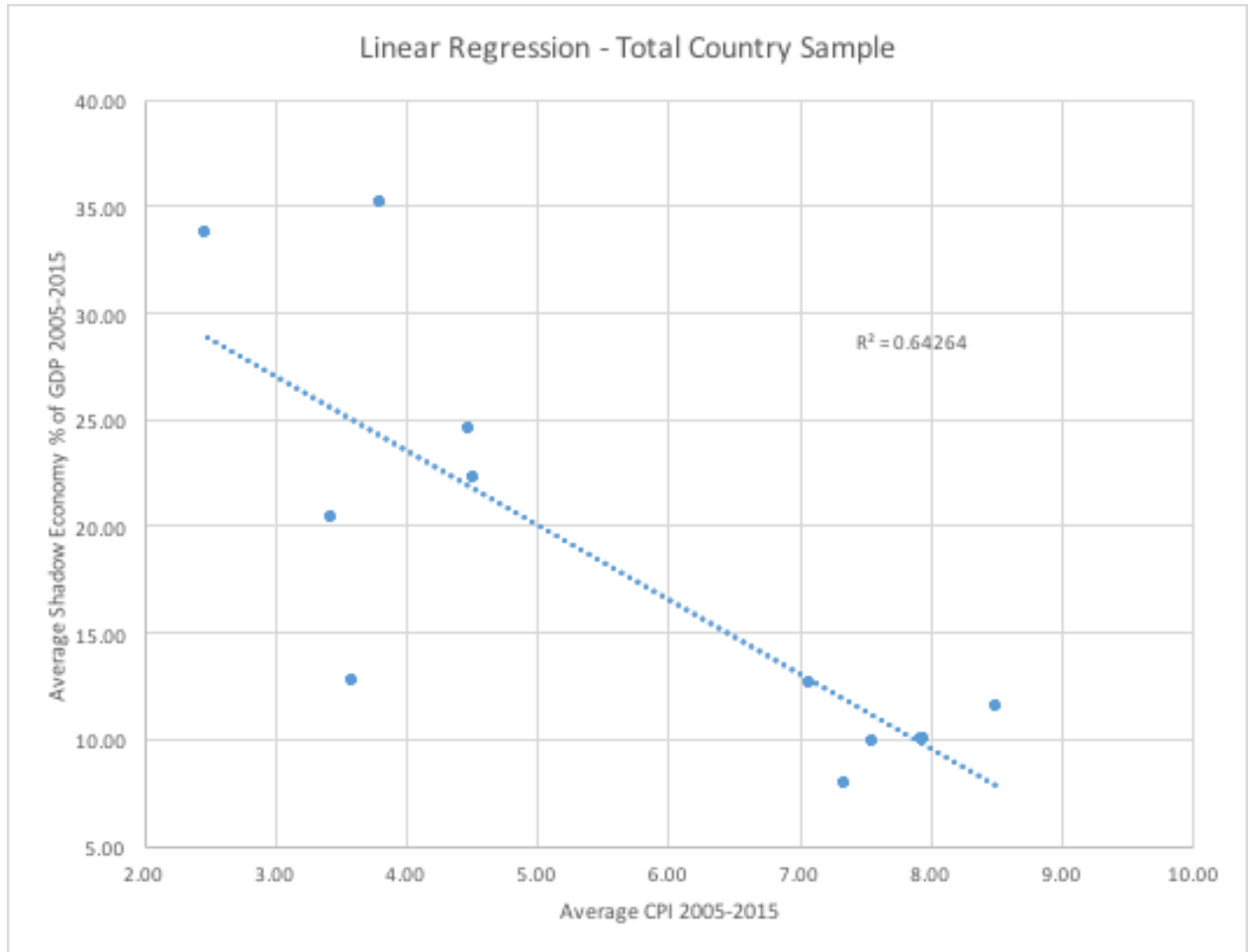


Figure 1: Linear regression of Total Country Sample – Average Shadow Economy vs. Average CPI

In the total country sample, the linear regression is downward sloping as seen in Figure 1. Table 1(a) shows the regressions statistics of the correlation between the average size of the shadow economy and the average CPI. There is a significant relationship between the perception of corruption and the size of the shadow economy since $p < 0.01$, a statistical significance at the 1 per cent level. The coefficient of the Average CPI is negative at -3.49. The R- Squared is 0.6426, which means that 64.26% of the variation in the size of the shadow economy can be explained through the variation that can be seen in the perception of corruption.

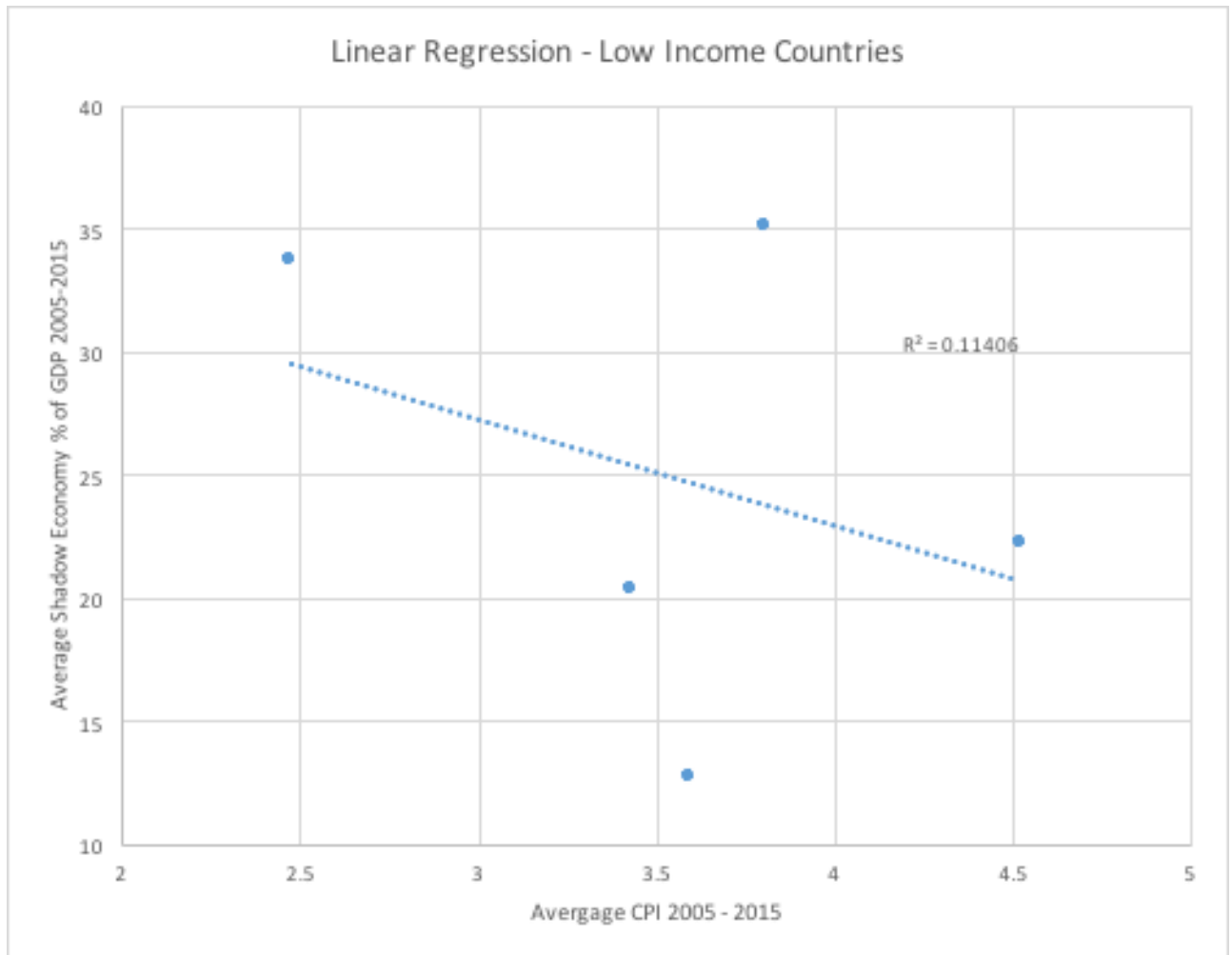


Figure 2: Linear regression of Low Income Countries – Average Shadow Economy vs. Average CPI

The linear regression for the low-income countries in this study, as seen in Figure 2, is downward sloping. Table 2(a) shows the regressions statistics of the correlation between the average size of the shadow economy and the average CPI. The significance level of the correlation between the variables when it comes to low-income countries is $p = 0.58$, which is much higher than the significance standard of $p < 0.05$. The correlation is insignificant as shown in the regression statistics in Table 2(a). The coefficient of the Average CPI is negative at -4.33. The R- Squared is 0.1141 which means that 11.41% of the variation in the size of the shadow economy can be explained through the variation that can be seen in the perception of corruption.

[illegible]

Table 2(a): Regression Statistics – Low Income Countries

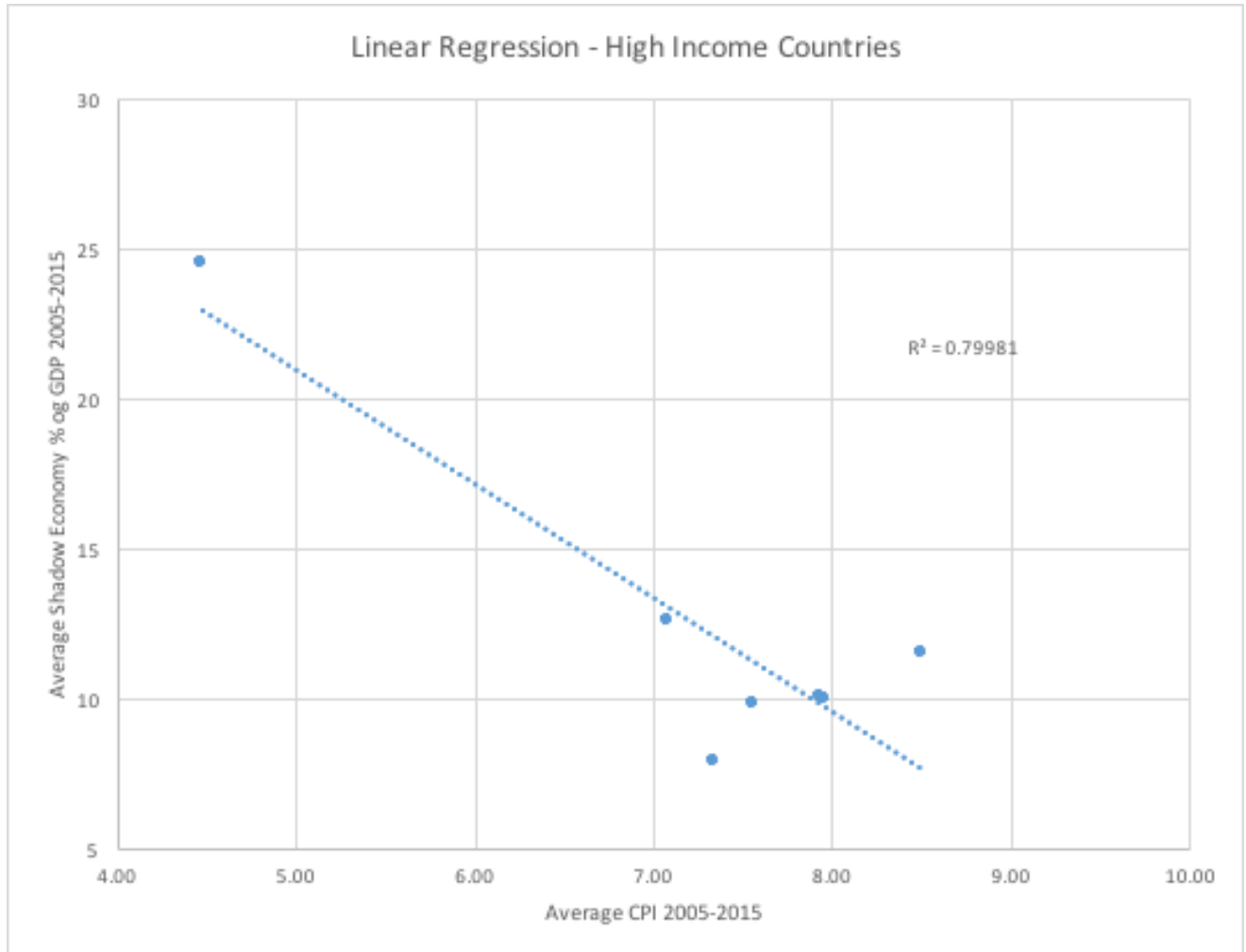


Figure 3: Linear regression of High Income Countries – Average Shadow Economy vs. Average CPI

In comparison to low-income countries, the linear regression of high-income countries shows a steeper fitted line as seen in Figure 3. The correlation between the perception of corruption and the size of the shadow economy is observed to be significant, with a $p < 0.005$. Table 3(a) outlines the regression statistics, which shows a negative coefficient of -3.79. The R-Squared is 0.7998 which means that 79.98% of the variation in the size of the shadow economy can be explained through the variation that can be seen in the perception of corruption.

HIGH INCOME COUNTRIES									
Regression Statistics									
Multiple R	0,89431951								
R Square	0,799807386								
Adjusted R Square	0,759768864								
Standard Error	2,728054924								
Observations	7								
ANOVA									
	df	SS	MS	F	Significance F				
Regression	1	148,66666	148,66666	19,9759465	0,006582634				
Residual	5	37,21141834	7,442283668						
Total	6	185,8780784							
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%	
Intercept	39,84216022	6,237954241	6,387055545	0,00139317	23,80698836	55,87733208	23,80698836	55,87733208	
Average CPI	-3,786202319	0,847130142	-4,469445878	0,00658263	-5,963819674	-1,608584965	-5,963819674	-1,60858496	

Table 3(a): Regression Statistics – High Income Countries

The results of the linear regressions presented above indicate that the perception of corruption does indeed have a significant effect on the size of the shadow economy, except in low-income economies. The downward slope of the regression and the negative coefficients of the average CPI are because the CPI is measured with a ranking of 0 to 10, with a rank of zero indicating a high perception of corruption and a higher rank indicating lower levels of perception of corruption. So for a given country, if the average CPI is high, the size of the shadow economy is smaller and vice versa. Although this pattern is not observable in the low-income countries, the possible reasons for this are discussed in the following section.

IV. Discussion

In the literature review, it was discussed that the levels of corruption in high-income countries do not have an effect on the size of the shadow economy, while in low-income countries, corruption has a high impact on the size of the shadow economy.

From the results of the regression analysis these findings by Schneider¹¹³ are negated, since the perception of corruption has a higher impact on the size of the shadow economy in high-income countries (the G7 countries). This could be explained by the differences in the timeline of shadow economies studied. While the size of the shadow economies in Schneider's study is calculated for the years 1990-2005, in my study years 2005-2015 are chosen, indicative of the transformation in the interaction between corruption and the shadow economy through these years.

The size of the shadow economy in my study is used as a proxy for the tax evasion rates, and the results are consistent with previous literature which find that the adverse effects of corruption on tax compliance are much larger in high income economies¹¹⁴.

On the other hand, consistent with other existing literature, the regression results of the total country sample show that corruption in an economy has an impact on the tax evasion rates. The results are also consistent with the PRV results, as when there is an increase in the prevalence of rule violations (corruption), there is also an increase in the dishonesty (tax evasion) in the society.

The regression statistics of the low-income countries show no significant correlation between the perception of corruption and the size of the shadow economy. This indicates

¹¹³ Ibid.,13.

¹¹⁴ Baum, Anja, Sanjeev Gupta, Elijah Kimani, and Sampawende Jules Tapsoba. "Corruption, Taxes and Compliance." IMF Working Paper (2017)

that other factors need to be considered to understand the relationship between the perception of corruption and the levels of tax compliance within a low-income economy since according to the PRV results, there should be higher levels of tax evasion in these countries with high PRV values.

The sample size chosen to study the relationship between tax evasion and corruption in low-income countries is not completely representative of the income bracket in comparison to the high-income countries.

In comparison to the G7 countries, the political and economic status of the BRICS countries is different. The tax structure could also have an effect on the results, as large percentages of the population of low-income countries fall under the tax bracket and therefore are automatically included in the shadow economy irrespective of corruption levels.

One of the main problems in calculating or measuring aggregated corruption indices is the concept of corruption. The CPI is not essentially a measure of corruption, but a measure of perceptions – a proxy version of the actual prevalence of corruption. Research has shown that the correlation between perceived corruption and actual corruption is low once other relevant factors are controlled for¹¹⁵ and perception-based indices reflect only the quality of a country's institutions and is not representative of the degree of corruption¹¹⁶. The CPI is an index that is constructed based on the views and opinions of experts in the field and experts from each of the countries being measured. Experts have been found to be an unreliable source, systematically overestimating the incidence of corruption and overestimating the tolerance of the local people to corruption. Experts were also found to be biased, rating countries according to their own political preferences and personal experiences¹¹⁷. Moreover, the results of the index are hard to interpret on a general scale and their meaning change from country to country because of the different types of corruption¹¹⁸. This could be one of the main reasons for the lack of correlation between the perception of corruption and the size of the shadow economy in low-income countries. In high-income countries, the slightest indication of corruption could change the political and

¹¹⁵ Mocan, Naci. "What determines corruption? International evidence from micro data" Working Paper 10460, NBER (2004)

¹¹⁶ Andvig, Jens Chr "A house of straw, sticks or bricks? Some notes on corruption empirics" Paper presented at the IV Global Forum on Fighting Corruption and Safeguarding Integrity (2005)

¹¹⁷ Razafindrakoto, Mireille and François Roubaud. "Are International Databases on Corruption Reliable? A Comparison of Expert Opinion Surveys and Household Surveys in Sub-Saharan Africa", Institute for Research & Development (Fr.) Paris (2006)

¹¹⁸ Thompson, Theresa and Anwar Shah "Transparency International's Corruption Perceptions Index: What Perceptions Are They Anywhere? (2008)

economic atmosphere of a country while in low-income countries, corruption is more widespread hence, also widely accepted and not criticised.

While the results of this study coincide with the hypothesis, there are limitations to the analysis of groups of low-income and high-income countries. The results attained in my study are only applicable to the combination of the 12 countries used in the study, and hence, the subsequent results are also dependent on and are limited to, these few observations. A future study of this same nature with different sample countries could yield varying results and analysis.

The PRV results, when compared to the CPI results, are also indicative of how the perception of corruption and its ranking is similar to the calculated prevalence of rule violations in the societies. Since the PRV index uses a different measurement of corruption, the results of both indicate comparable levels of corruption in the countries studied. Taking Russia as an example, the country's PRV value is the highest at 3.16 and from the total country sample also has the lowest average ranking on the CPI between 2005-2015. Future research in this topic could benefit from choosing a combination of corruption measures, instead of only using the CPI. Since there are no studies that measure actual corruption rates, the perception of corruption indices such as the CPI could be combined with the World Bank's Control of Corruption Index to get a more accurate value.

The theory of psychic cost of tax evasion describes the reason for high tax compliance levels because of the effects of individual honesty and behavioural factors that influence the decision to be honest. Taking into consideration the results of the total country sample and the PRV results, the psychic cost of tax evasion is reduced when there is a high prevalence of corruption because we see that as corruption increases the rate of tax evasion also increases.

V. Summary and Conclusion

The main aim of this article was to study whether the "psychic cost" felt by individuals while making the decision to evade taxes is reduced or completely eliminated in the presence of corruption in an economy. The results observed from studying the correlation between the perception of corruption using the CPI and the size of the shadow economy as a proxy for the rate of tax evasion indicate that corruption does, in fact, increase tax evasion behaviour, therefore reducing the psychic cost of tax evasion.

The PRV values created using the method prescribed by Gaetcher and Schulz provide the basis for this research: how the prevalence of rule violations affects the intrinsic honesty of

an individual. The higher the PRV value, the greater is the dishonesty observed in a society. For the sample pool in my study, Russia has the highest value while Canada has the lowest. From these results, it is uncovered that the changes in the levels of corruption in these countries should indicate a change in tax evasion behaviour, as it is essentially a form of dishonesty or cheating.

A correlation study between the Corruption Perceptions Index as a measure for corruption and the size of the shadow economy representing the tax evasion rate shows that for the countries in my study, the change in the perception of corruption has a significant effect on the size of the shadow economy. Linear regressions for high-income economies and low-income economies show that while corruption does not have a significant impact on the tax evasion rates in low-income countries, corruption has a highly significant effect on tax evasion rates in high-income countries.

This correlation study has linked the effects of rule violations (corruption) on the intrinsic honesty of individuals (tax evasion behaviour) in the context of tax compliance/evasion behaviour. It could be indicative of the fact that a change in the prevalence of rule violations also causes a change in the intrinsic honesty of an individual.

The theory of the psychic cost of tax evasion was realised in an attempt to increase the tax compliance rates by targeting the psychological distress experienced by individuals when making dishonest decisions, while the theory of intrinsic honesty discovers that individual honesty is affected by the prevalence of rule violations. From my research, it is found that in the presence of corruption, the psychic cost of tax evasion is reduced, since there is an observed increase in tax evasion rates.

Although the main results of this study are in line with the hypothesis, the fact that corruption has no significant effect on the tax evasion rates in low-income economies is indicative of certain drawbacks in my study. Future research on this topic could benefit from adopting a larger sample size, as then a more accurate comparison can be made between low-income and high-income countries. The measure of corruption used could be modified to include a combination of various other measures of perception of corruption since they have different sources and experts evaluating corruption. Finally, I find that there is a lack in the research of a more precise measure of tax evasion rates. Tax compliance and evasion has been a vastly researched topic over the years, and further research into finding a universal measure for tax evasion would prove beneficial to future studies in the field.

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Supplementary Information

COUNTRY	SHADOW ECONOMY % of GDP										
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Brazil	38,47	37,62	37,05	35,16	36,90	34,55	33,06	32,71	32,56	33,01	35,22
Russia	36,41	35,47	34,59	32,60	36,79	33,70	32,03	31,88	32,21	31,04	33,72
India	23,44	22,06	21,03	21,68	22,27	20,65	19,71	18,99	18,11	18,33	17,89
China	14,12	13,84	13,82	12,79	12,83	12,13	12,03	12,41	12,25	11,74	12,11
South Africa	25,44	21,33	21,81	20,35	23,41	23,23	22,08	22,20	21,47	21,33	21,99
Canada	13,57	12,92	12,87	12,02	12,26	10,71	10,46	11,28	11,21	10,05	9,42
France	13,96	13,31	12,88	11,61	13,89	13,11	11,81	12,08	12,41	12,12	11,65
Germany	12,61	11,41	10,56	9,59	11,69	10,88	9,05	8,85	9,22	8,17	7,75
Italy	24,62	23,81	22,43	23,51	27,31	26,13	24,54	25,53	24,49	24,33	22,97
Japan	10,91	10,35	10,14	9,21	10,39	9,93	9,89	9,73	9,28	8,69	8,19
United Kingdom	11,39	10,44	10,78	9,83	11,00	10,33	10,06	9,91	9,57	8,81	8,32
United States	7,86	7,47	8,00	7,76	9,18	8,71	8,23	7,83	7,66	7,04	7,00

Table (i): Size of the Shadow Economy % of GDP 2005-2015

COUNTRY	PERCEPTION OF CORRUPTION (CPI)										
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Brazil	3,70	3,30	3,50	3,50	3,70	3,70	3,80	4,30	4,20	4,30	3,80
Russia	2,40	2,50	2,30	2,10	2,20	2,10	2,40	2,80	2,80	2,70	2,90
India	2,90	3,30	3,50	3,40	3,40	3,30	3,10	3,60	3,60	3,80	3,80
China	3,20	3,30	3,50	3,60	3,60	3,50	3,60	3,90	4,00	3,60	3,70
South Africa	4,50	4,60	5,10	4,90	4,70	4,50	4,10	4,30	4,20	4,40	4,40
Canada	8,40	8,50	8,70	8,70	8,70	8,90	8,70	8,40	8,10	8,10	8,30
France	7,50	7,40	7,30	6,90	6,90	6,80	7,00	7,10	7,10	6,90	7,00
Germany	8,20	8,00	7,80	7,90	8,00	7,90	8,00	7,90	7,80	7,90	8,10
Italy	5,00	4,90	5,20	4,80	4,30	3,90	3,90	4,20	4,30	4,30	4,40
Japan	7,30	7,60	7,50	7,30	7,70	7,80	8,00	7,40	7,40	7,60	7,50
United Kingdom	8,60	8,60	8,40	7,70	7,70	7,60	7,80	7,40	7,60	7,80	8,10
United States	7,60	7,30	7,20	7,30	7,50	7,10	7,10	7,30	7,30	7,40	7,60

Table (ii): Perception of Corruption (CPI) 2005-2015

COUNTRY	Average. CPI (2005-2015)	Average Shadow Economy (2005- 2015)
Brazil	3,80	35,12
Russia	2,47	33,68
India	3,43	20,38
China	3,59	12,73
South Africa	4,52	22,24
Canada	8,50	11,52
France	7,08	12,62
Germany	7,95	9,98
Italy	4,47	24,52
Japan	7,55	9,85
United Kingdom	7,94	10,04
United States	7,34	7,89

Table (iii): Average CPI and Average Shadow Economy

PLEDGE OF HONESTY

On my honour as a student of the Diplomatische Akademie Wien, I submit this work in good faith and pledge that I have neither given nor received unauthorized assistance on it.

A handwritten signature in black ink, appearing to read 'Parwin', with a long, sweeping flourish extending upwards and to the right.

Parwin Azeez