

Thinking about Corruption in Greece¹

by

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Abstract

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The paper addresses the issue of corruption, which appears to be endemic in Greece. It reviews the facts about corruption as a multifaceted phenomenon and its relationship to tax evasion, by comparing Greece to its EU partners as well as internationally. It looks at corruption as an example of anti-social behavior through the prism of modern theories of social interactions and property rights. Our research offers both bad and good news. The bad news is that corruption is rampant in Greece, and with a much higher incidence than in other EU countries. One way to deal with it is by means of zero tolerance and relentless vigilance. A second way to deal with corruption is to design institutions that encourage honest behavior and facilitate reporting of abuses. The good news from the paper is that an outcome thoroughly permeated by corrupt practices is not the only possible social and economic outcome. Taste for proper social behavior can be taught and learned, and adverse practices discussed in this paper may be altered by suitable reforms and retraining of public servants.

The EU Task Force for Greece is a very good case in point, and so is the Greek Annex of the EU Anti-Corruption Report.⁴ The latter details a specific legislative agenda to combat anti-social practices in Greece. We conclude that decisive enforcement of anti-corruption statutes is needed if Greece desires to reduce anti-social behavior. The paper reviews EU proposals regarding enforcement mechanisms and proposes three key constitutional amendments that will help long-delayed reforms to take hold in Greece.

Keywords: Bribery, compliance, constitutional amendments, corruption, corruption perception index, economic growth, fiscal deficits, games, multiple equilibria, public goods, tax evasion, trust, whistleblowing.

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1. Introduction

The Great Recession along with the onset of the Greek crisis spotlighted a number of facts showing that corruption is an endemic problem in Greece. To start with, we note that the Transparency International Corruption Perception Index⁵ places Greece at the very bottom of the EU 28 countries; and 99% of the Greek respondents in a recent European Commission Eurobarometer survey (European Commission, Anti-Corruption Report, 2014) think that corruption is widespread in their country. Data on corruption and other forms of anti-social behavior, collected from extensive surveys and other sources, are summed up in Section 2.

The key questions are: Why does Greek society tolerate so much corruption? What can be done to control it? To deal with the first question we propose to look at ideas from economic theory and political science which explain why and how individuals choose to seek bribes and engage in various forms of expropriating income from others. The second question takes us into a review of the policy recommendations made by the European Commission and others seeking to discourage corruption in Greece.

Greek citizens who may experience corruption as an everyday event may naturally think that “corruption is tolerated” and that “corruption pays.” Why is corruption so widespread? Is there a link between perceptions of corruption and *actual* corruption? We look at these questions in two different ways. One [Benhabib and Rustichini (1996)] is to think of corruption as a tax on legitimate economic activity, that is, on the wages and capital income earned by productive members of society. Perceptions of widespread corruption are equivalent to a high corruption tax which steers many citizens away from legitimate work, is informal and unpredictable, and generates “tax revenue” that is privately appropriated. Closely related to corruption is the phenomenon of tax evasion because of two reasons: one, it reportedly involves large-scale bribery of public officials; two, it is another and conceptually related instance of antisocial behavior.

Another way to approach this problem is through the prism of the social interactions literature [Brock and Durlauf (2001); Durlauf and Ioannides (2010); Ioannides (2013), Ch. 2] This helps to conceptualize how corrupt practices and widespread tax evasion can emerge when individuals interact within common social settings. If different occupational groups have exposure to corrupt practices in varying degrees, then the incidence of corruption will vary across the population. As we discuss in detail below,

in all such analyses, requiring that individuals' propensity to engage in corrupt practices is consistent with what the typical individual expects to prevail, in other words, what individuals expect to prevail -actually does prevail because of individuals' actions that lead to multiple alternative social outcomes. That is, it is, in general, possible that prevailing corruption may alternatively be either _ widespread, moderate, or rare. For example, in a society where peer pressure is operative, an individual's perception that others engage in corrupt practices may provide an incentive for him or her to also do so. Yet, such a belief is one of many factors determining individual decisions. Because these decisions are made in an uncoordinated setting, it is possible to have alternative intensities of corruption which are self-confirming. Corruption is rare, where because others are not corrupt, one is also induced to be not corrupt. Corruption is widespread, at the other extreme. There is also an intermediate possibility, which is suggested by specific models used by the social interactions where corruption is moderate. As we further below, the two extreme outcomes are stable and the intermediate one unstable.

Corruption is defined by Transparency International as the “abuse of entrusted power for private gain.”⁶ We define corruption more broadly to include tax evasion, especially when evasion is aided and abetted by tax officials, reportedly a rampant practice in Greece.⁷

The next section reviews some facts about corruption and tax evasion in Greece as background for the remainder of the exposition.

From a pragmatic point of view, the key issue is what can be done about corruption. Growth theory, an established branch of macroeconomics, finds it helpful to think of corruption as a tax on income and wealth. Such a tax is born by all the members of a society, perhaps in varying degrees and given different individuals' exposure to actual corrupt practices.

Corrupt individuals benefit from it, but all suffer the consequences of the tax. For example, licensing ineligible individuals to perform professional services in exchange for bribes impacts the entire society via its consumption of substandard services. Society can reduce the burden of this tax by pouring resources into enforcement and deterrence. Hiring more policemen and prosecutors helps and so does the removal of laws that shield embezzlers of public funds through statutes of limitations or other means. In the case of tax evasion as an instance of corruption, the resulting burden as a tax on those who comply with the tax laws is literal. They are asked to pay more to make up for the shortfall of tax revenue, a burden that also feeds social bitterness. This has been felt with particular acuteness since the onset of the Greek crisis through huge tax increases on compliant taxpayers, especially those with incomes that are hard to misreport.

The theory of social interactions gives an alternative: we may fight corruption by changing social perceptions of it. A society is made up of individuals who enter into myriads of formal and informal interactions every day. Some of these interactions are exchanges of goods, services or favor, and their social counterparts serve as a conduits for exchanges of opinions and information, and for observation of personal values and related practices. Social life provides the setting for uncoordinated actions that are self-confirming. For example, some activities have a dress code, but others do not. Individuals are expected to anticipate what is appropriate because of a desire to conform.

In the area of corruption, how do we persuade the public not to expect or tolerate the worst? Interactions between individual and collective decisions provide the basis for a large possible variety of prevailing practices. Some of them corresponding to higher levels of social welfare, and less corruption, than others. To switch from a bad behavioral pattern to a good one requires a small ‘revolution in expectations’ or jolt to social norms, which may happen in several ways.

Inducements against corruption include a variety of measures, some of them suggested by the European Union, others by Christopher Pissarides and ourselves in op-ed writings. For example, can social media and the web be used constructively in changing attitudes? One example is

social media as tools that can “shame” anti-social individuals and public officials.⁸ Another is whistleblowing, and independent authorities like the Office of the Ombudsman in Greece.⁹ Above all, expectations may depend on how society deals with embezzlement and conflicts of interest by members of the political and labor elites.

2. Facts

Information about corruption and, to a lesser extent, about tax evasion comes from recent surveys conducted on behalf of the European Commission, and from regular annual reports by Transparency International. One of these surveys, taken in 2013, measures business attitudes towards corruption, published by the Eurobarometer. Another is a series of Europe-wide anti-corruption reports with annexes for each EU member country.¹⁰ These are particularly helpful because the data, collected from answers to common questionnaires for the years 2005, 2007, 2009, 2011, and 2013, are of uniform quality. But because much of the information collected tends to be somewhat qualitative, these data sources have not received the attention they fully deserve.

Starting from 2005, for the question QC 4.1, “corruption is a major problem in our country”, 94% of Greek respondents answered affirmatively, more than any other EU country [Eurobarometer (2005), p.

5]. In contrast, only 27% of Finnish and 24% of Danish respondents answered affirmatively. Responses for 2007 are similar, while worse for Greece at 97%, and better for Finland and Denmark, at 25% and 22%, [Eurobarometer (2007), p. 4.] Rolling forward, the situation is unchanged for Greece and Denmark in 2009 (and worse for Finland), unchanged for Greece and better for Denmark in 2011, and roughly unchanged again for 2013 country [Eurobarometer (2013), p. 20].

Further below we return to these data by means of an econometric analysis, reported in Box 1, p.??.

INSERT TABLE 1 HERE

Caption: Percent of Business Respondents Agreeing that the Following Take Place

These data are consistent with the information collected by Transparency International and by the World Bank. Transparency International ranks Greece at the bottom of the EU 28 for perceived corruption (see Figure 1). The World Bank's *Doing Business Report* has listed Greece at around the 80th place among 185 countries for ease of doing business for several years until an improvement to the 36th place occurred very recently.

INSERT FIGURE 1 HERE

Caption: Summary Rankings for Transparency International
Corruption Perception Index and Control of Corruption, 2013

International agencies point out that Greece has not implemented the OECD Anti-Bribery Convention which requires lobbyists to register with the government and to report contacts with public officials. The weak finances of Greek mass media, their close relationships with politicians and major economic interests, and the failure of the Greek government to promptly legislate proper use of the electromagnetic spectrum as a state asset and to enforce existing legislation, have been blamed as factors that prevented media from exercising their normal mission to expose government corruption or safeguard the public interest (Eleftheriadis, 2012).¹¹ Greek law and constitutional rules require parliamentary approval before prosecutors can investigate or bring to trial any members of Parliament or serving government. Even with such approval, the actions of current or past ministers are protected by statutes of limitations that expire within one year of the alleged misconduct. Malfeasance by politicians or civil servants seldom leads to punishment. A grand total of only 91 civil servants have been dismissed for bribery or corruption from the beginning

of 2012 through the middle of 2013 (Inspector General of Public Administration, 2013).

As we have already mentioned, closely related to corruption is the phenomenon of tax evasion because of two reasons: one, it is reported to involve large-scale bribery of public officials; two, it is another and conceptually related instance of antisocial behavior. What are the facts about tax evasion in Greece?

Using micro data supplied by a large private bank, Artavanis, Morse and Tsoutsoura (2012) estimate unreported income in 2009 to be at least 10% of GDP and 30% of the government budget deficit.¹² Matsaganis, Leventi and Flevotomou (2012) give alternative estimates based on Greek tax returns and on the EU Survey of Income and Living Standards conducted from 2006 to 2010. They find that the average rate of underreporting for 2006 is 11.8%, resulting in a short fall of tax receipts of 27.8% [*ibid.* p. 27].¹³ For the top 1% and 0.1% of incomes, their estimates are 24.9% and 30.1%, respectively. They also find that self-employed persons report on average only 60% of their actual income and farmers only 20%.

Income tax evasion in Greece is, not surprisingly, facilitated by its extensive informal sector, which was estimated at 27.5% of GDP for

1999—2007, larger than any other EU country and higher than the OECD average of 20% [Schneider and Buehn (2012)].

Lost tax revenue is a multifaceted issue in Greece [see IMF (2013), June]. Revenue is lost because business activity is not formally declared and registered but operates underground in the shadow economy; because individuals evade taxes; and, because tax evaders use legal but often unfair means.

Tax avoidance, as distinct from tax evasion, is plausibly due to reliance on ambiguities, loopholes and convenient self-serving interpretations that help reduce tax obligations. For example, social security contributions are much smaller for self-employed relative to salaried employees, which increases the attractiveness of self-employment and thus affects occupational choice leading to smaller average sizes of business organizations. Like the income tax, the value-added tax is also evaded. VAT evasion too is facilitated by the extensive informal sector.

Actual VAT and corporate income tax collections relative to the VAT are much lower in Greece compared to the EU average. IMF (2012) reports that the VAT gap in Greece in 2006 was 30%, compared to a EU average of 12%. Income and VAT tax rates are at the high end among OECD countries. Undisputed tax arrears reached 56 billion euro at the end of

2012, nearly 90% of annual revenue collection, more than 60% higher than any other EU country except Slovakia. Tax arrears may themselves lead to real tax revenue loss [Tagkalakis (2014)].

Audits by the tax authorities tend to focus on bookkeeping formalities rather than assessments of tax liabilities, and are generally not as productive because they use limited third party information (like access to bank accounts) to detect inconsistencies between declared and actual income and wealth. In spite of high nominal penalties for tax evasion, poor management of audits and frequent tax amnesties make it cheaper for taxpayers not to declare tax liabilities even if the taxable income is eventually detected.

Corruption in the delivery of public services along with poor quality and excessive bureaucracy may combine with social permissiveness to sustain tax evasion. Furthermore, the glaring inability of the government to pursue tax evasion by particular groups of the population feeds into the public perception of an unfair tax collection system. Salaried employees, who have fewer opportunities to evade audits, are subject to payroll taxes deducted at source and pay more in taxes.

It is natural to wonder about how deeply rooted in Greece are corruption and tax evasion, the two instances of antisocial behavior which we are emphasizing in this paper. Economists have sought to understand

the origins of antisocial behavior, and understanding of their deeper roots might be helpful in thinking about how to combat them. Papaioannou (2011) in his “Civic Capital(ism)” TEDx Talk¹⁴ seeks deep causes of the Greek crisis rather than proximate ones. By drawing attention away from the twin deficits, he instead advances the challenging view that the Greek crisis is a deeper one, with a role for social values and lack of civic capital as the true causes. Papaioannou sees the current state of legal institutions, property rights, regulation, and protection of investors as generally weak and not conducive to the modernization of Greece. Another key factor is trust, an essential part of civic or social capital. Many studies show that distrust is negatively correlated with income per capita and positively correlated with corruption.

Algan and Cahuc (2014) offer numerous tabulations of trust-related measures deriving from the World Values Survey, the European Values Survey (1981-2008) and the Afrobarometer (2005). The key variable they use is the answer to the question: “*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*” Trust is recorded as 1, if the respondent answers “*Most people can be trusted,*” and 0, otherwise. Average trust levels over the study period, tabulated in Figure 2.1b, *ibid.* p. 64, reprinted below as Figure 2, place Greece below all other EU countries, except for Malta,

Croatia, Malta, Slovenia and Slovakia, and numerous non-EU countries. Relative to Norway, which ranks highest, and holding individual characteristics constant, the fact of living in Greece rather than Norway reduces trust by 51% (*ibid.*, Figure 2.4, p. 69). Data show that generalized trust is an important contributor to economic growth.

INSERT FIGURE 2

Caption: Average trust levels in 111 countries

Trust is negatively correlated with the prevalence of labor market regulations (*ibid.*, Figure 13), and with inequality, as measured by the Gini coefficient (*ibid.*, Figure 16), positively correlated with the quality of the legal system (*ibid.*, Figure 14), and with life satisfaction (*ibid.*, Figure 19).

One question asked of respondents in the Social Values Survey was: "Do you think it can always be justified, never be justified, or something in between to claim government/state benefits to which you have no rights?" Papaioannou (2013), Fig. 16b, shows that Greece is an outlier. While in most countries more than 60% of the population believes that people should never claim social benefits that they do not have a right to, in Cyprus, France, and Slovenia more than half of respondents argued that at least in some instances it is justifiable to claim such benefits." For

Greece, the only survey available that includes this question is in 2000. It reports that almost 80% of the population replied that it was justifiable to get benefits from the state that one is not entitled to.¹⁵

The provision of public goods requires cooperation to achieve socially beneficial outcomes in the presence of free-rider incentives. Voting, paying taxes, fighting corruption, contributing to public goods, teamwork, common pool resource management, recycling, are just some examples where cooperative behavior pays off. These are frequent situations with the common feature that cooperation leads to a beneficial outcome for an entire group but is jeopardized by selfish incentives to free ride on others' contributions. Below we make further progress along such lines by clarifying that the same fundamentals may be associated with multiple alternative social outcomes, seen as social equilibria.

Hermann *et al.* (2008) report results from laboratory experiments with public goods games, focusing on a phenomenon that has been largely neglected: People might punish not only free-riders, but cooperators too. For example, in an experimental game that those researchers set up, participants who had been punished in the past for contributing too little might retaliate against cooperators because cooperators are precisely those individuals most likely to punish the free-riding low contributors. The experimental evidence obtained by these

researchers from 16 participant pools with various cultural and economic backgrounds across the world shows that antisocial punishment of prosocial cooperators is indeed widespread in many participant pools. Societies represented in their participant pools covered by their study diverge strongly according to several widely used criteria developed by social scientists in order to characterize societies.¹⁶

The results are notable. The Athens pool, made up of samples of Panteion University students, scored lowest of all 16 cities in the experiment in terms of the mean contributions to the public good over the 10 rounds of the P experiment. At the same time, the Athens pool scored the second highest in terms of mean antisocial retaliation, with average retaliation and average contributions per participant pool being very strongly and significantly negatively correlated across all periods. The authors interpret the findings as suggesting that the quality of the formal law enforcement institutions and informal sanctions are complementary. Informal sanctions might be more effective in sustaining voluntary cooperation when formal law enforcement institutions operate more effectively because antisocial retaliation is lower in these societies. The detrimental effects of antisocial punishment on cooperation (and efficiency) also provide a further explanation why modern societies shun revenge and centralize punishment in the hands of the state. This

particular finding involving the Athens pools of subjects could have been dismissed as unimportant, were it not for the fact that it agrees with a common exhortation used among Greek youths, in high schools and university settings. Advice “don’t spoil the market” is directed at persons who violate current norms of anti-social behavior, and thus help maintain solidarity and commonly agreed rules of anti-social behavior.¹⁷

3. Social Equilibria with Antisocial Behavior

Let us think about a typical public policy situation where individual welfare depends on the consumption of a private good, of leisure and of a public good. Next assume that a government imposes a proportional tax on labor incomes to finance the provision of the public good. To simplify matters, we suppose that labor income taxation does not affect labor supply. A benchmark solution occurs when a hypothetical benevolent government sets the income tax rate to achieve maximum social welfare by balancing the loss of individual welfare (when taxes are raised and private consumption falls) against the improvement in social welfare from the higher provision of the public good.

To study the impact of rampant tax evasion, we assume that individuals can ignore with impunity the official tax rate, and in effect set their own tax rates, while recognizing that public good provision has to be

financed somehow. Since public goods cannot be financed out of nothing, individuals must decide how they wish to contribute, assuming a given level of contribution by other taxpayers. Everyone acts in like manner: they all recognize that they stand to benefit from the provision of the public good at some level and, as a result, each one of them free-rides on everyone else. When individuals decide how much to contribute, each one takes as given, and beyond their control, the amounts they expect the others will contribute. The resulting level of the public good financed from the sum total of everyone's contribution, would typically be lower than what a benevolent government would bring about by extracting mandatory contributions from all citizens, that is by fully enforcing taxation. This reflects the lack of social coordination which, in turn, leads to an inferior social outcome.

The inferior social outcome becomes a “race to the bottom”; it is the outcome of free riding by each individual who does contribute in order to prevent a wholly undesirable loss of welfare to himself, all along assuming that others will also contribute. The greater the number of other individuals contributing, the less each one will want to share. The individually optimal “voluntary tax rates” sum up to less than what would have been the socially optimal rate. This story is a caricature of a tax system intended only to underscore the consequences of a government’s inability to

enforce compliance by individuals with taxes it imposes. Nonetheless, as a way to think about Greece's tax problem, it is quite a useful one, as we discuss next.

(a) **Good and Bad Social Equilibria**

Implicit in the above description is the idea that each individual's optimally chosen "own tax rate" is unique, given the behavior of others. This does not have to be true in general, and indeed it is likely not to be in many settings where the social context matters. We return to this in more detail below, but to see it simply, suppose that individuals are conformist, that is, they follow what they expect others to do. Then the more similar individuals are in terms of their underlying characteristics, the more likely it is that their expectation of what others are likely to do (which we call social effects here) are decisive in determining individual choice. This in fact generates the possibility of three alternative patterns ("equilibria."). Good intentions to pay one's "fair share" of taxes can be overcome by the impact of bad influences from one's social milieu, that is, by a strong urge to conform to what others are doing. Suppose that social effects (that is, social influences, or social norms) are originally weak. That is, few people are prepared to pay substantial contributions towards the public good. If the social effect became stronger, initially it induces (or perhaps it would encourage) individuals to follow what is developing as the dominant social

behavior. Ultimately, the impact of social effects on individual behavior may weaken and vanish, but there will be some “reasonable” norms of behavior that are self-confirming.

This possibility is demonstrated in Figure 3¹⁸, where the horizontal axis measures a typical individual’s *expectation* of the social outcome and the vertical axis measures an individual’s own expected outcome. The three different curves A, B, and C picture different sets of fundamentals, which could be consistent with different social outcomes. When the expected outcome for an individual coincides with his/her expectation of the social outcome, then society is in what is known as a *Nash equilibrium*. This is pictured when the 45-degree line through the origin intersects with the respective curve.

INSERT FIGURE 3 HERE

Caption: Multiple Nash Equilibria in Anti-social Behavior

This result deserves a closer look. When individuals are really different, large fractions of the population will experience large differences in random factors that determine individual choice. Included among those are social effects, that is, how strongly individuals are influenced by the actions of others. That will narrow the scope for self-confirming behavior.

Curve A corresponds to the situation where non-compliance is inherently more attractive, relative to an individual's evaluation of the social outcome, and thus non-compliance prevails as the unique social outcome (m_{\sim} for curve A is on the negative half-axis). In such a case, marginal improvements in enforcement, either by means of more and possibly random¹⁹ audits and/or larger penalties can increase the inherent attractiveness of compliance. However, given fundamentals, enforcement needs to be sufficiently powerful to shift the curve to a higher position, like to curve B, and if they are drastic enough to shift it to curve C. Similarly, curve C corresponds to the situation where compliance is inherently more attractive, relative to an individual's evaluation of the social outcome, and thus compliance prevails as the unique social outcome (m^* for curve C is on the positive half-axis).

This line of reasoning also illustrates that tepid enforcement could lessen compliance, e.g., by shifting the curve upwards but still allowing it to still have a unique equilibrium associated with non-compliance.

If individuals are broadly similar, the social effect is more powerful than other determinants. The social effect at first dominates individual attitudes, then becomes proportional to them, and at the end tapers off. This is exactly the analytical setting that allows multiple self-confirming behaviors in socio-economic systems. The idea is pictured by curve B,

Figure 3, which intersects with the 45-degree line at three points, $m\sim$, m , and m^* . We note that such a situation could indeed be the outcome of stricter enforcement, relative to curve A, but still not strong enough to shift it up to curve C, which is associated with compliance as a unique equilibrium indicated by point m^{**} . We underscore that only drastic enforcement can move the economy from, say, point m on curve B to point m^{**} on curve C, that is, from widespread non-compliance to widespread compliance.

This mode of thinking validates, *inter alia*, use of perceptions of corruption (which underlies the Transparency International Rankings) as an indicator of corruption. Further below we report an econometric analysis with Eurobarometer data that makes particular use of information on both perceptions and experience of corruption.

The conceptual framework presented above helps sharpen our understanding of the scope for different policies. Suppose that the high-level outcome is associated with greater provision of the public good. Suppose also that the government institutes rewards for those who comply and punishments for those who do not. How does this change the equilibrium outcome?

So far we have discussed taxation as motivated by the need to finance the provision of public goods. Of course, taxation also finances

redistribution and the demand for redistribution is often a justification for larger governments. A number of studies, which are of particular relevance to Greece, link bigger governments to more corruption, which in turn raises the support for redistributive policies to mitigate the effects of unequal access to returns from corruption across the population. If opportunities to engage in corruption and rent seeking are unequally distributed in the population and/or generate wealth that is unequally distributed, a positive feedback from past to present corruption emerges which in turn reinforces the persistence of bigger governments. Alesina and Angeletos (2005) show that under certain conditions multiple steady state equilibria may exist, that are entirely due to the presence of corruption. Thus, political support for redistributive policies intended to reduce inequality can bring about more corruption. Corruption begets more corruption through bigger governments, in those settings. At the same time, inspection of Figure 1 suggests that EU countries with big governments and big public sectors do very well in terms of corruption, which implies that other forces are present, such as redistributive policies that do not necessarily discourage work and investment.

(b) Social Effects in Tax Evasion

Individuals' attitudes toward tax evasion are likely shaped by social forces.²⁰ Hence, our understanding of tax evasion²¹ is likely to improve our ability to design policy. Yet, there is no empirical research with actual data. The most notable existing research studies on the topic use either experimental data, such as Fortin *et al.* (2007) and Kaplanoglou and Rapanos (2013), or numerical simulations, such Llacer *et al.* (2013).

Kaplanoglou and Rapanos (2013), in particular, report results with an experimental study using 350 volunteer subjects, recruited from among undergraduates at the University of Athens who were assigned to four hypothetical settings and instructed accordingly.²² Their econometric analysis shows that trust increases voluntary compliance, and power (defined as tax authorities' working efficiently and implementing tax laws), increases enforced compliance. Power has no influence on voluntary compliance in the high trust setting, but high power is associated with lower voluntary compliance in low trust setting. The authors interpret these findings as suggesting that power of tax authorities is perceived as legitimate in high trust conditions, but as coercive otherwise.

We conclude this section by recalling that when social effects influence individual decisions about tax compliance, they create multiple tax evasion outcomes. Nonlinearity is critical for equilibrium multiplicity

and is associated with presence of endogenous social effects. Unfortunately, there have been no empirical studies anywhere with real data that can be brought to bear on the question of social effects in tax compliance, however compelling the presence of such effects might be.

At the same time we note that positive association of the fundamentals many associate with social trust is quite consistent with this story. Factors that cause trust to improve bring about better social outcomes. Yet, such a positive association, which permeates a number of studies discussed earlier, glosses over possibilities that may be fruitfully examined as multiple local equilibria.

(c) Corruption: Measurement, and Experience versus

Perception

We turn next to measurements of corruption in Greece. The latest surveys for Greece, reported by Transparency International Greece (2013d), show a decline in reports of corruption cases: the fraction of households in the sample reporting corruption declined from 13.4%, in 2009, to 10.4%, in 2010, and to 8.2% in 2012. The extent in which this is related to the crisis is not known, except that it has persisted since its onset. The Annual Report for 2012 of the Inspector General for Public

Administration documents an increased drive, tabulated below on Table 2, to bring charges and to convict civil servants in Greece.

INSERT TABLE 2 HERE

Caption: Prosecutions, Indictments and Convictions, 2007-2012

Transparency International blames many factors for the high level of corruption in Greece: dysfunctional democracy, weak rule of law, lack of transparency in the work of the government, influence of political parties on public administration, excessive discretion in the exercise of public authority, legislative complexity, bureaucracy, lack of audits and sanctions, lack of codes of conduct in the public and private sectors, complex mechanisms for identifying corruption, anemic civil society, and inadequate education of citizens in matters of corruption. There is, naturally, also a multitude of other factors at work, including waste of financial resources, distortion of competition, weak moral codes, a spreading culture of tolerance and fatalism, and prevalence of a system of corrupt legality [*ibid.*, p. 26]. This report also outlines the evolving legal framework for combating corruption in Greece.

It is tempting to interpret the widespread incidence of corruption as an intrinsic Greek characteristic. However, a comparison with Cyprus, a

country that is culturally and linguistically very similar to Greece, might suggest otherwise. Cyprus has consistently scored much higher in Transparency International rankings while Greece has been slipping. Furthermore, indirect evidence that cultural origin effects in corruption may be overcome by institutions is reported by Barr and Serra (2010). These authors conducted a bribery lab experiment in the UK and found that, among undergraduates, they could indeed predict who would act corruptly with reference to the level of corruption in their home country. That effect disappeared, however, among graduate students. They replicated their result in 2007 and also found that time spent in the UK was associated with a decline in the propensity to bribe, although that finding did not explain their inability to predict behavior among graduate students. These authors conclude that while corruption may, in part, be a cultural phenomenon, individuals should not be prejudged by their country of origin.

In spite of availability of these metrics, it is widely recognized that corruption is very hard to measure. Furthermore, perceptions of corruption are often relied upon extensively in discussions of corruption. They form the basis for Transparency International's Annual Corruption Perception Index (CPI) and the World Bank's Control of Corruption Index. This leads to the natural question of how important a factor is perceptions of

corruption in influencing actual corruption? We find this question has a natural answer from the theory of social interactions, and one that helps better understand corruption as a social phenomenon.

Olken (2009) is a particularly significant study, in that it uses empirical evidence on perceptions of corruption and on actual corruption from Indonesia. Olken finds that perceptions of corruption do contain information about actual corruption. Olken and Pande (2012) review the evidence on corruption in developing countries and find robust evidence that corruption responds to standard economic incentives: for example, public officials find alternate strategies to pursue rents when anti-corruption drives are in effect. Still, corruption as actually measured [e.g., Table 1, *ibid.*], appears to be rather small.

In an effort to bring as much information as possible to bear upon the incidence of corruption in Greece, relative to the other European Union countries, Ioannides and Murthy (2014) use micro data from all four cross-sections of the Eurobarometer to study the experience of corruption against the perception of corruption across all EU countries. Their ordered logit regression (with the experience of corruption as a dependent variable and perception of corruption as an explanatory variable), takes account for groups of observations associated with different EU countries and allows for a large number of additional explanatory variables based on individual

demographics. These variables are defined and more details are given in the Box that follows. The perception of corruption is highly significant at the 1% level, with a positive coefficient for all four survey years, while controlling for all other variables. This finding suggests that the social effect, as defined by these authors, is important. Admittedly, the Ioannides and Murthy finding does rely on those authors' interpretation of the survey questions. This does not mean that corruption perceptions "cause" corrupt behavior; it is nonetheless evidence of a social effect. The higher the perception of corruption, the higher the experience of corruption.

Quantitatively, for 2005, a one unit increase in perception of corruption would increase the log odds of experiencing one more instance of corruption by 0.125. The country dummy for Greece is positive and highly significant. This means that, everything else being equal, Greek respondents were more likely to experience corruption. See Box below for more details.

Insert BOX about here

BOX begins

The Eurobarometer study publishes micro data for 2005, 2007, 2009, 2011 and 2013 [Eurobarometer Data, various years] from roughly 1000 observations from each EU country, amounting to a total of 26856

observations. Ioannides and Murthy (2014) interpret as *perception of corruption* the answer to the following question (2011, QC4): ``In (our country), do you think that the giving and the taking of bribes, and the abuse of positions of power for personal gain, are widespread among any of the following?" The categories listed range from police, customs, the judiciary, politicians at the national, regional and local levels, officials awarding contracts, or business and building permits, people working in the public education or the public health sectors, to inspectors in health, construction, food quality, sanitary control and licensing. Ioannides and Murthy recode the micro data as the sum of affirmative responses under these categories into a categorical variable ranging from 0 to 14. They interpret as *experience of corruption* the following question (2011, QC5): ``Over the last 12 months, has anyone (in our country) asked you, or expected you, to pay a bribe for his or her services?" They recode the micro data as a categorical variable, that ranges from 0, if the answer is ``no, nobody did," or equal to the sum of individual responses to each of the above categories. Interestingly, those two variables in their raw data form are very weakly correlated: their Spearman correlation coefficient is equal to 0.177. Thus, they likely report different information.

Ioannides and Murthy experiment with a number of alternative econometric specifications; one is a Poisson regression, because the

recode data is based on counts; a second is an ordered logit regression with the experience of corruption as a dependent variable, and the perception of corruption as an explanatory variable, along with country dummy variables for each of the EU countries. They choose to emphasize the ordered logit regression, because as the appendix to the present chapter clarifies, its underlying analytics fit better the canonical social interactions approach adopted by the paper. That is, the ordered logit model expresses analytically very well that the likelihood of experiencing corruption is related to the perception of corruption through the cumulative distribution of the logistic function. The estimation allows for 13 discrete thresholds plus a large number of explanatory variables based on all available individual demographics, such as age ranges, occupational categories and gender. Regressions were carried out separately for all five survey years and show the following results:

- (a)The perception of corruption is statistically highly significant, variable, at the 1% level, with positive coefficients, while controlling for all other variables. This shows that the social effect is important.
- (b)The higher the perception of corruption, the higher the experience of corruption. In particular, the estimated coefficients for perception of corruption are 0.114, 0.0895, 0.0724, and 0.0677, respectively, for 2005, 2007, 2009, and 2011, all significant at the 1%

level. Quantitatively, for 2005, a one unit increase in perception of corruption would increase the log odds of experiencing one more instance of corruption by 0.125.

(c) The country dummy for Greece is positive and significant at less than 1% for all samples except 2007 and 2009, when it is significant at 5%.

(d) Among the various EU countries, and for 2013, the country dummy is also positive and significant (in addition to Greece) for Austria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Bulgaria, Romania, and Croatia. It is negative and significant for Great Britain and Sweden, and it is insignificant for all other countries.

(e) The estimated country dummy for Greece is the second smallest among those that are significant. Among the other countries, the largest coefficient is for Lithuania followed by Romania. There is, however, variation among the countries over the four different survey years.

In order to help mitigate possible criticism of this formulation, namely that it might be that experience of corruption causes perception of corruption, Ioannides and Murthy (2014) also regress perception of corruption against experience of corruption. The estimated coefficient of experience of corruption is also very significant, those for the other regressors are not as intuitively appealing, and the overall fit is slightly

inferior. The interpretation of such a regression is, however, akin to social learning, and thus provides support for the notion of social effect. Although those two variables are weakly correlated, the more corruption citizens experience the greater the perception of its importance. We hasten to add that one should not interpret the coefficients of the dummy variables indicating specific countries as implying that the larger the coefficient, the higher the experience of corruption unconditionally. Instead, the interpretation is conditional on the values of all other explanatory variables. The effect of the perception of corruption is in fact very different across the EU countries, when regressions are run with country-specific data separately. We feel that these estimates provide a tentative justification for the significance of social influences on corruption.

BOX ends.

(d) Industrial Organization of Corruption in Greece and its Implications²³

Our analysis so far has addressed corruption primarily by means of microeconomic tools. We have looked at how individuals make decisions in a social context and how individual responses can be consistent with society-wide alternative patterns of widespread, moderate or rare

corruption. Government policy can interfere with individual decisions and thus avert antisocial outcomes, a possibility that is easiest to contemplate in the context of tax evasion. As the appendix details, sufficiently vigorous enforcement by either high probabilities of audits and/or larger penalties for non-compliance can induce the typical individual, and thus a social group, to move towards full compliance.

Improving tax compliance in practice requires honest behavior by the tax collection administration, as well, where employees at several hierarchical layers of bureaucracy may be exposed to similar temptations for dishonest behavior as individual tax payers. In view of at least anecdotal evidence of corruption by tax authorities in Greece,²⁴ anticorruption policies must address the “industrial organization” of corruption, a term due to Vishny and Shleifer (1993). A similar problem occurs with requesting permits or licences, where several layers of a particular public sector branch must sign off on a particular authorization, making an individual vulnerable to requests for bribes and quid pro quos, or other forms of rent seeking. So, for an individual dealing with the Greek public sector, all levels of the respective bureaucracy must sign off, creating a complementarity among all those steps. Thus, for a country like Greece its very bureaucratic public sector does not only generate delays and excess permitting costs but also provides many opportunities for

corrupt behavior. It is necessary to stamp out all of the opportunities in every hierarchy of decision making in order to create effective administration. Thus fighting corruption can be combined with reforming the organizational structure of the public sector by reducing its bureaucratic structure and simplifying its provision of services. At the same time, we know from Vishny and Shleifer (1993) and Aghion *et al.* (2010) that government regulation is strongly correlated with distrust. Thus, improving social trust along with simplifying government regulations will also help make the public sector less conducive to corrupt behavior.

Policies aimed at stamping out corruption must recognize the incidence of corruption in a modern society. There are instances of large-scale corruption involving bribes and other forms of rent seeking associated with politicians in charge of major public sector procurements, like defence equipment purchases and public works contracting. Any legal system would treat such instances of corruption differently from petty “decentralized” corruption affecting individual citizens in dealing the public sector. Of course, when practiced extensively, the private and social costs of petty corruption add up to serious macro consequences, and must be dealt with. Other instances of decentralized corruption are accommodated by cooperative social values and can be pervasive. For example, public servants in personnel recruitment positions have unlimited ways to favor

relatives, friends and acquaintances. In many societies, and arguably in Greece too, it is culturally and socially acceptable to trade meritocracy for favoritism. This results in a culture of permissiveness. Such practices cannot be easily stamped out by means of specific policies and instead require long-run efforts through the educational system, to be complemented by the efforts of parents and all institutions involved in shaping the value systems of younger generations.²⁵

In important ways the clientelist nature of the Greek political system plays an important role in maintaining decentralized petty corruption. That is, by granting favors of different sorts within their bailiwicks (e.g., public sector jobs, favoritism in access to social benefits, special grandfathering deals and exclusive or even fraudulent loan guarantees) corrupt politicians help ensure their own survival. There exists a socially decentralized demand for corruption transmitted via the political system, which is met by wholesale supply and facilitation of corruption at the top. Such a symbiotic relationship is best highlighted by the famously crude pronouncement (and book by the same name) by former Deputy Prime Minister Theodore Pangalos, *We Stole it all together* [Pangalos (2012)]. However crudely cynical and self-serving, especially coming as it is from such a long-standing and prominent PASOK politician, that phrasing is quite apt: it does prompt questions about how Greek civil society instills values and

moral fundamentals in political life. If antisocial behavior in the form of corrupt practices is deeply ingrained and entangled with the political system, via interactions between citizens and politicians, then even the most draconian punishment of offending politicians will not go far enough in eliminating antisocial behavior.²⁶

4. Corruption and Growth

(a) Fiscal Deficits and Corruption

Corruption affects a country's government spending through several channels. First, a given amount of public expenditure delivers less in terms of goods and services. Welfare fraud, lack of transparency and kickbacks in awarding public projects stand out and have regularly been mentioned in many countries, including Greece, as leading examples of corruption. Second, corruption in the form of tax evasion lowers the tax yield from standing legislation. Corrupt practices in the management of public debt add to the deficit by increasing borrowing costs and interest rate spreads. They may also increase the perceived uncertainty associated with a country's public debt. By increasing the cost of doing business, corruption also lessens competitiveness and thus contributes to external deficits.

In industrialized countries, possible causal links between fiscal deficits and corruption have not been investigated until relatively recently. Kaufmann (2010) is a notable exception. He draws attention to the fact that measures of corruption control like the World Governance Indicators compiled by the World Bank vary widely among EU countries: one standard deviation between Greece and Spain and more than two standard deviations between Greece and Finland. These variations correspond to large differences in fiscal balances, positive for Finland, negative for Spain and even more so for Greece. The coexistence of several channels between corruption, government spending and taxes leads to a correlation coefficient of 0.52 between corruption control and fiscal balance [Kaufmann (2010)]. Achury, Koulouvatianos and Tsoukalas (2013) show that among Eurozone countries during 1996-2010, fiscal balance improves one percent per unit increase of the Corruption Perception Index!

Achury, Koulouvatianos and Tsoukalas (2013) also offer a political economy theory of how excessive rent seeking and non-cooperation by rent seekers worsens a country's ability to handle fiscal deficits, and thus exacerbates debt dynamics. The mechanism they highlight is a tragedy-of-the-commons problem leading to a vicious circle of high interest rates and default. If rent-seeking groups are not prepared to cooperate in fiscal

governance, then excessive debt issuance is inevitable. Non-cooperating rent-seeking groups wish to avail themselves of additional resources earlier, before other groups do so, which amounts to collective “impatience.” The greater the number of rent-seeking groups the greater the collective impatience. This impatience leads to demands for high interest rates from the nation’s creditors and immediate or eventual sovereign default. By increasing the uncertainty about a country’s fiscal management as perceived by the markets, corrupt practices fuel a spiral of increasing borrowing spreads and further increases in deficits, very much like self-fulfilling currency crises. Their model implies that to prevent such a dysfunctional outcome in the presence of rent seekers, a country needs to maintain a lower debt to GDP ratio.

(b) Institutions and Growth

If corruption is not an inherent attribute in any society, it must be a matter of choice for some or all of its citizens. This trivial syllogism means that Swiss citizens have made a deliberate choice in favor of sound institutions while the citizens of many nations in South Asia, Latin America and Southern Europe have gone the other way. How societies choose institutions has been a central theme in political economy and economic

history since the 1970's [cf. North (1990), Skaperdas (1992), Acemoglu *et al.* (2005)]. Of particular importance in this literature is the social choice of property rights, that is, of the fraction of income earned by labor and capital which society chooses to shield from the rapacity of thieves, corrupt officials and other rent-seekers.

To understand what is at stake, consider an economy consisting of many different individuals. Suppose all of them are equally good at rent seeking (say, with gross productivity equal to one unit) but unequal at earning honest income (say, gross productivity varies from one-half to two units). How will individuals divide into mutually exclusive groups of workers and rent-seekers, that is, between productive activities and corruption? How will voters collectively decide how much to protect property rights?

Firmly enforced property rights in this context function like a tax on the productivity of rent seekers, which reduces revenue from dishonest work. Strong property rights will deter rent-seekers from appropriating honestly earned income and, perhaps more importantly, reduce the attractiveness of rent-seeking as an occupation. On the minus side, good institutions are expensive: they need to be implemented by a judicial system of laws, judges, prosecutors, inspectors and policemen who must

be paid by taxes levied on honest citizens. Societies seem to face a trade-off between two taxes: the cost of corruption and the cost of enforcement. For any level of property rights, rational individuals will choose the occupation—thieving or honest work-- that gives them the highest income. For example, a relatively expensive regime of firm property rights will tax honest work and deliver low corruption and few rent seekers. This choice will appeal to most productive citizens but not to those who have a comparative advantage in rent-seeking. Having many educated citizens raises the chances that society will choose firm property rights over lax ones, and good institutions over feeble ones.

What does this mean for the questions asked at the beginning of this subsection? Why have Swiss citizens consistently opted for stronger, and more expensive, institutions than those in other countries? Four reasons seem to be of relevance to the Swiss experience. One, a large mass of Swiss citizens are sufficiently educated to earn incomes above those of rent seekers. Two, Switzerland is rich enough in capital to the point where relatively labor intensive rent-seeking does not pay off as well as honest work which is more capital intensive, Three, expectations of strong property rights discourage rent seekers and raise the fraction of citizens who favor good institutions. And four, any political bias towards

the status quo discourages changes in existing institutions—good or bad. Switzerland benefits from this inertia. Greece suffers from it.

Finally, we need to understand a bit more deeply the importance of civic capital as a self-reinforcing mechanism that steers society towards good outcomes when it exists in abundance, and to poor outcomes when it is in short supply. Civic capital reinforces itself when it influences how well the public expects institutions to work in the future. Will society govern itself by rules that are fair to all or by laws stacked in favor of certain groups? When civic capital is plentiful and institutions treat everyone fairly, citizens will choose honest work over corruption in overwhelming numbers, thereby reducing the corruption tax to insignificance and enhancing the economic attractiveness of honest work. A large amount of this “capital” is a good substitute for strong deterrence against criminals and embezzlers or for an all-out war against corruption. Crime does not pay when civil society is well developed.

At the most basic level, civic capital is a form of shared trust that society will be ruled by transparency, fairness and peace. From a technical standpoint, civic capital is an *equilibrium selection device*, that is, a set of habits and moral codes which lead societies to select good outcomes over mediocre or bad ones when all three are possible.

An example from public finance is a clear case in point.

Governments that wish to raise a given sum in tax revenue have two options: impose a low tax rate that will enlarge their tax base and bring in the desired tax revenue; or choose a high tax rate that shrinks taxable incomes and collects the same revenue. The first outcome is more desirable and feasible if citizens do not evade taxes. The second one is inevitable when they do. Which one prevails depends on civic capital, that is, on what each citizen expects others will do.

5. Conclusions and Policy Recommendations

(a) Conclusions

Writing in the *New Yorker*, July 11, 2011, James Surowiecki states: “If a hefty chunk of the population is cheating on its taxes, people who don’t (or can’t, because of the way their income is reported) feel that they’re being abused. The result has been a vicious circle: because tax evasion is so common, people trust the system less, which makes them less willing to pay taxes. And, because so many don’t chip in, the government has had to raise taxes on those who do. That only increases the incentive to cheat, since there tends to be a correlation between higher tax rates and higher rates of tax evasion.”

Because corruption and tax evasion are so common, civic capital in Greece has contracted to the point where people do not trust the system much, which makes them less willing to behave honestly or pay taxes. A consequence of the government's raising taxes on those who do pay them is a disincentive to continue being honest. Thus, tax rates are even higher if we add in the burden of corruption on honest economic activity. High tax rates only increase incentives to cheat still more and evade taxes to a greater extent, which completes the vicious circle but does not stop it.

The essence of the present paper is that research brings both bad and good news. The bad news is that corruption is rampant in Greece, and with a much higher incidence than in other EU countries. One way to deal with it is by means of zero tolerance and vigorous relentless vigilance. As we now know, the successful criminal prosecution of Former Minister A. Tzochatzopoulos and his accomplices (for fiscally significant abuse of power and bribe-taking) has been particularly welcomed by Greek public opinion. A second way to deal with corruption is to design institutions that encourage honest behavior and facilitate reporting of abuses. The good news from this paper is that an economic and social equilibrium that is permeated by corrupt practices is not the only possible social outcome. Taste for proper social behavior can be taught and learned, and adverse practices, discussed in this paper, may be altered by

suitable reforms and retraining of public servants. The EU Task Force for Greece is a very good case in point,²⁷ and so is the Greek Annex of the EU Anti-Corruption Report.²⁸ The latter details a specific legislative agenda to combat anti-social practices in Greece.

In announcing the US District Court verdict in the prosecution of Rod J. Blagojevich, former governor of Illinois, for corruption, US District Court Judge James B. Zagel²⁹ said before telling Mr. Blagojevich his fate: "The harm here is not measured in the value of property or money, the harm is the erosion of public trust in government."

(b) Policy Recommendations

Governing requires trust. This is true for firms and organizations of all sizes and types. It is also true for every modern state. To restore public trust in the political process, we believe that *Greek citizens will have to witness political events that have never happened in the last fifty years*, in particular severe limits on the privileges of professional politicians, an all-out war on corruption, and fair taxation. Serious political reform, including all of the draconian proposals we list below, requires enormous changes. Those include not only changes in the current law but also constitutional amendments that facilitate prosecuting members of the executive, legislative and judicial branches of government for embezzlement, for bribery, for tax evasion, and for other forms of illegal enrichment.

The policies we propose below to combat corruption fall into two categories: proposals (i) through (vi) which require legislative changes within the existing constitutional framework; and amendments (1) through (3) that need constitutional tinkering. Among the proposals contained in the Greek Annex of the EU Anti-Corruption Report for 2014, we judge the following to be most urgent:

- i. Institute legislative protection of whistleblowers;
- ii. Formalize lobbying and compel lobbyists to register with the Office of the Inspector General of Public Administration and report all contacts with public officials.
- iii. Require political parties to keep and to publish audited income-and-expense statements, and mandate use of international auditors.
- iv. Abolish all statutes of limitations on crimes committed by members of Parliament and government ministers.
- v. Improve the transparency of public procurement, and the capacity of the Supreme Audit Council to oversee state purchases.
- vi. Devise and implement strategies to combat fraud in pensions, healthcare, and the tax administration.

Implementing these proposals will be immensely facilitated if citizens come to place a bit more trust in their government. To achieve that, we suggest the following constitutional amendments.

To discourage politics as a lifetime career we propose

Amendment 1: Parliament is reduced to 100 members. After a maximum of 12 years of service, members become ineligible for re-election or for any paid or unpaid work in the broader public sector.

We note that the current Greek Constitution does allow for the number of its members to be 200, a limit that could be enacted by means of a law.³⁰ There is also a fair amount of experience with term limits worldwide, which could be used to bolster the case with the Greek public. Given that the time between elections and the lifespans of Greek parliaments have become shorter, term limits should reflect both time in office and the lifespan of the respective parliaments.

To combat embezzlement and bribery at high levels we propose a draconian

Amendment 2:

(a) Embezzlement, bribery and other serious misuses of public funds or positions of authority are a high crime for politicians, labor and business leaders and for high-level civil servants. Charges of these crimes can be filed with no statute of limitations by any citizen or

public prosecutor, and must be adjudicated to a final conclusion within one year by specially constituted administrative courts. Those convicted face mandatory penalties that include loss of pension rights, forfeiture of embezzled wealth, and life imprisonment.

(b) The forfeited wealth of convicted embezzlers is shared between the Greek State and citizens who filed charges.

(c) Victims of unproven or disproved corruption charges are entitled to compensation from their accusers.

To combat tax evasion, whose arrears amount to 25% of Greek public debt as of this writing, we propose

Amendment 3: Major tax evasion is a crime punishable by fines and incarceration. Tax returns of wealthy individuals are audited regularly and randomly by anonymous tax officials.

Draconian measures to be effective require expedient adjudication of cases. This provides additional arguments in favor of critical reforms in the Greek justice system, whose weaknesses are examined in depth by another chapter of this book [Papaioannou *et al.* (2015)]. Draconian

measures that are legislated but are not truly implemented (including measures mandated by the agreements associated with the Stabilization Program) breed cynicism and are unfortunately a serious problem in Greece, especially since much of the administration of the justice system is not immune to government pressure. Draconian measures, of course, pit the need to confer discretion to elected officials and to protect them against witch-hunting and political party agendas, while they are disposing of their duties, against the checks and balances of a democratic society. Ultimately, improving the ability of the country's legal system underpins the effective administration of effective measures.

Thus fresh approaches must be sought, including empowering independent authorities. The example of Hong Kong, touted by Romer (2010), is a good case in point and argues in favor of the design of a supranational institution to fight corruption, which could operate along the lines of others EU supranational institutions, like the European Court of Auditors and the Office of the European Ombudsman and its national offshoots.³¹ An independent supranational authority can also be answerable directly to heads of state.³² It is our conviction that it would take a very high level approach beyond the purview of local political control, with EU-level institutions playing a role akin to that of US federal authorities vis-à-vis US states.

With a need for a proper phrasing in terms of constitutional language aside, these three amendments must also be accompanied by concerted efforts to build up civic capital. Our goal is to generate a consensus for changing the entire value system of nihilism and anti-social behavior that parents and schools have allowed to percolate through Greek society. We realize that deep structural changes go against long-held privileges of established interest groups and also against the inertia of the inherited status quo. As we have all learned from experience, investment and material progress are very difficult within the institutional corruption that is so thoroughly ingrained in the Greek body politic.

The key question is the same as it was when the present depression erupted in Greece around 2009: Will public opinion embrace the long-delayed reforms that are essential for the country's survival in the global environment of the 21st century? Or will they stand by and watch the nation slide into the backwater of the Balkans as it did from the 13th to the 18th century?

REFERENCES

- Acemoglu, D., S.Johnson and J.A. Robinson. 2005. "Institutions as a Fundamental Cause of Economic Growth". In *Handbook of Economic Growth*, ed. By P.Aghion and S Durlauf. Elsevier.
- Achury, C., C. Koulovatianos, and J. Tsoukalas. 2013. "Political Economics of External Sovereign Defaults." October. Mimeo.
- Aghion, P., Y. Algan, P. Cahuc, and A. Shleifer. 2010. "Regulation and Distrust." *Quarterly Journal of Economics* 125(3):1015--1049.
- Alesina, A., and G.-M. Angeletos. 2005. "Fairness and Redistribution." *American Economic Review* 95(4):960—980.
- Algan, Y., and P. Cahuc. 2014. "Trust, Growth, and Well-Being: New Evidence and Policy Implications." Aghion, P., and S.N. Durlauf, eds. *Handbook of Economic Growth*. Vol. 2A, Ch. 2, 49-120, Elsevier: Amsterdam and New York.
- Allingham, M. G., and A. Sandmo. 1972. ``Income Tax Evasion: A Theoretical Analysis." *Journal of Public Economics*. 1:323--338.
- Alm, J. 2012. "Measuring, Explaining, and Controlling Tax Evasion: Lessons from Theory, Experiments and Field Studies", *International Tax and Public Finance*, 19:54-77.
- Artavanis, N., A. Morse, and M. Tsoutsoura. 2012. ``Tax Evasion across Industries: Soft Credit Evidence from Greece." University of

Chicago Booth School working paper, June.

<http://faculty.chicagobooth.edu/Margarita.Tsoutsoura/research/papers/TaxEvasionWebAugust.pdf>

Barr, A., and D. Serra. 2010. ``Corruption and Culture: An Experimental Analysis." *Journal of Public Economics* 94:862--869.

Benhabib, J., and A. Rustichini. 1996. "Social Conflict and Growth." *Journal of Economic Growth*. 1:125-142.

Brock W.A. and S.N. Durlauf. 2001. ``Interaction-Based Models." In *Handbook of Econometrics* 5, J. Heckman and E. Leamer, eds. Amsterdam: North-Holland.

Durlauf, S.N., and Y.M. Ioannides. 2010. ``Social Interactions." *Annual Review of Economics* 2:451—478.

Eleftheriadis, P. 2012. "What Is Wrong with Greece?" *Financial Times*, April 24.

EU Anti-Corruption Report 2014. 5

EU Special Eurobarometer Survey. 2012. *Corruption*. February.

http://ec.europa.eu/public_opinion/archives/ebs/ebs_374_en.pdf

EU Special Eurobarometer Survey. 2014. *Corruption*. February.
http://ec.europa.eu/public_opinion/archives/ebs/ebs_397_en.pdf Fortin, B., G. Lacroix, and M.-C. Villeval. 2007. "Tax Evasion and Social Interactions", *Journal of Public Economics*, vol. 9(11-12), 2089--2112.

Eurobarometer Data. Various years.

<https://dbk.gesis.org/dbksearch/home.asp>

Eurobarometer. 2005. 64.3 <http://dx.doi.org/10.4232/1.10971>

Eurobarometer. 2007. 68.2 <http://dx.doi.org/10.4232/1.10986>

Eurobarometer. 2009. 72.2 <http://dx.doi.org/10.4232/1.11137>

Eurobarometer. 2011. 76.1 <http://dx.doi.org/10.4232/1.11847>

Eurobarometer. 2013. 79.1 <http://dx.doi.org/10.4232/1.11855>

Ferraz, Claudio, and Frederico Finan. 2008. "Exposing Corrupt Politicians: The Effects of Brazil's Publicly Released Audits on Electoral Outcomes." *Quarterly Journal of Economics*. 703—745.

Herrmann, B., C. Thoni, S. Gachter. 2008. ``Antisocial Punishment across Societies.'' *Science* 319, 1362. (incl. supporting material)

IMF. 2013. "Greece: Selected Issues." Country Report No. 13/155, June.

Inspector General of Public Administration. 2013. *Annual Report* (Greek).

http://www.gedd.gr/article_data/Linked_files/105/EktheshGEDD2012.pdf

Inspector General of Public Administration. 2014. *Annual Report* (Greek).

http://www.gedd.gr/article_data/Linked_files/114/EktheshGEDD2013.pdf

Ioannides, Y.M. 2013. *From Neighborhoods to Nations: The Economics of Social Interactions*. Princeton University Press, Princeton, NJ.

Ioannides, Y.M., and A. Murthy. 2014. "Social Effects in the Experience of Corruption using the Eurobarometer Data: 2005—2013." In progress.

Kaplanoglou, G., and V. T. Rapanos. 2013. ``Why Do Greeks Evade their Taxes? Some New Experimental Evidence." working paper. March.

Kaufmann, D. 2010. "Can Corruption Adversely Affect Public Finances in Industrialized Countries?" Brookings Institution
<http://www.brookings.edu/research/opinions/2010/04/19-corruption-kaufmann>

Korobow, A., C. Johnson, and R. Axtell. 2007. "An Agent-Based Model of Tax Compliance with Social Networks." *National Tax Journal* LX(3):589—610.

Ladi, S. 2011. "Policy Change and Soft Europeanization: The Transfer of the Ombudsman Institution to Greece, Cyprus and Malta." *Public Administration* 89(4):1643--1663.

Leventi, C., and M. Matsaganis. 2013. "Distributional Implications of Tax Evasion and the Crisis in Greece." In Marlier, E. (ed). *The Use of*

Registers in the Context of EU-SILC: Challenges and Opportunities.

Eurostat methodology and working papers.

Llacer, T., F.J. Miguel, J. A. Noguera, and E. Tapia, 2013. "An Agent-Based Model of Tax Compliance: An Application to the Spanish Case." *Advances in Complex Systems* forthcoming.

Matsaganis, M., C. Leventi, and M. Flevotomou. 2012. "The Crisis and Tax Evasion in Greece: What Are the Distributional Implications?" CESifo Forum 13(2): 26—32.

North, D.C.1990. *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.

Olken, B. O. 2009. ``Corruption Perceptions vs. Corruption Reality.'' *Journal of Public Economics*. 93(7-8):950-964.

Olken, B. O., and R. Pande. 2012. "Corruption in Developing Countries." *Annual Review of Economics* 4:479-505.

Pangalos, Theodore. 2012. *We “Ate” it all together (Ta fagame Oloi Mazi)*. In Greek; e-book.

Papaioannou, E. 2011. ``Civic Capital(ism) TEDx Talk.''
<http://www.youtube.com/watch?v=S5nth5jCP0>.

Papaioannou, E. 2013. "Trust(ing) in Europe." London Business School working paper.

- Papaioannou, E., Pavlos Eleftheriadis, and Stavroula Karatza.
2015. "The Institutionalized Injustice of the Greek Legal System." Chapter
?? This volume.
- Rakintzis, L. "Speech to Transparency International." Conference:
"State and Corruption."
- http://www.transparency.gr/Uploads/File/AcA_Rakintzis.pdf
- Romer, Paul. 2010. "Cutting the Corruption Tax."
<http://www.voxeu.org/article/cutting-corruption-tax-way-out-greece>
- Schneider, F., and A. Buehn. 2012. "Shadow Economies in Highly Developed OECD Countries: What Are the Driving Forces?" IZA DP 6891. October.
- Skaperdas, S. 1992. "Cooperation, Conflict and Power in the Absence of Property Rights". *American Economic Review*. 82:720-739.
- Surowiecki, J. 2011. "Dodger Mania." *The New Yorker*, July 11, 2011.
http://www.newyorker.com/talk/financial/2011/07/11/110711ta_talk_surowiecki
- Tagkalakis, A. O, 2014. "Tax Arrears and VAT Revenue Performance." *Economics Bulletin*, 34(1):106—121.
- Tanaka, Shinsuke. 2013. "Uncovering the Market Prices of Bribes: The Effect of Information Technology on Corruption in India." Fletcher School discussion paper.

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2327607

Transparency International, Greece. 2013a. Conference: "State and Corruption."<http://www.transparency.gr/Press.aspx?page=27&code=Press Release&article=344>

Transparency International, Greece. 2013b. "Less and Cheaper Fakelaki in Greece: The Key Results of 2012 National Survey on Corruption in Greece."

http://www.transparency.org/news/pressrelease/20130307_less_and_cheaper_fakelaki_in_greece_the_key_results_of_2012_nation

Transparency International. 2013c. "National Integrity System Assessment Greece."

http://www.transparency.org/whatwedo/pub/nis_greece_2012

Transparency International, Greece. 2013d. ``National Research on Corruption in Greece."

Transparency International, Greece. 2013e. ``Alternative to Silence: More Effective Protection and Support for Whistleblowers in Greece."

http://www.transparency.gr/Uploads/File/TI-G_WB-REPORT_2013.pdf

TABLES

Table 1

Caption: Percent of Business Respondents Agreeing that the Following Take Place

	EU	Greece
Tax fraud	42	52
Widespread bribery	23	48
Very widespread corruption	76	99
Daily life affected by corruption	26	63

Table 2

Prosecutions, Indictments and convictions, 2007-2012

Source: Inspector General of Public Administration, Annual Report, 2012

Page 30,

http://www.gedd.gr/article_data/Linked_files/105/EktheshGEDD2012.pdf

Submitted in Excel.

Year	2007	2008	2009	2010	2011	2012
Number	302	478	375	432	561	866
Per cent	10	16	12	14	19	29

FIGURES

Figure 1

Caption: Summary Rankings for Corruption, 2013

Source: EU Anti-Corruption Report 2014. Country sheet Greece.

http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/organized-crime-and-human-trafficking/corruption/anti-corruption-report/docs/2014_acr_greece_factsheet_en.pdf

Figure 2

Caption: Average trust levels in 111 countries.

Source: Figure 2.1b, Algan, Y., and Pierre Cahuc (2014).

Figure 3

Caption: Multiple Equilibria in Anti-social Behavior

Source: Authors

Figure 1

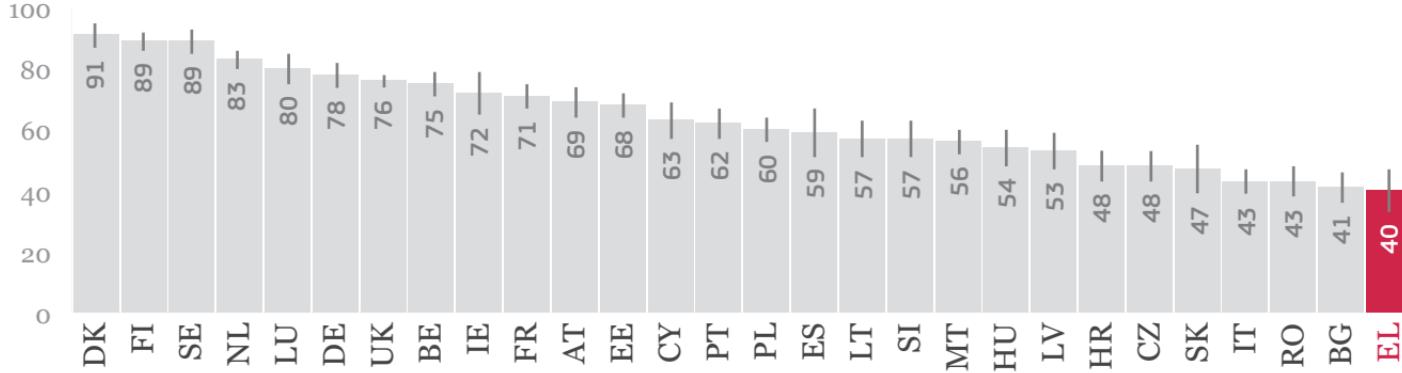
Page 2 of

File name/URL

http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/organized-crime-and-human-trafficking/corruption/anti-corruption-report/docs/2014_acr_greece_factsheet_en.pdf

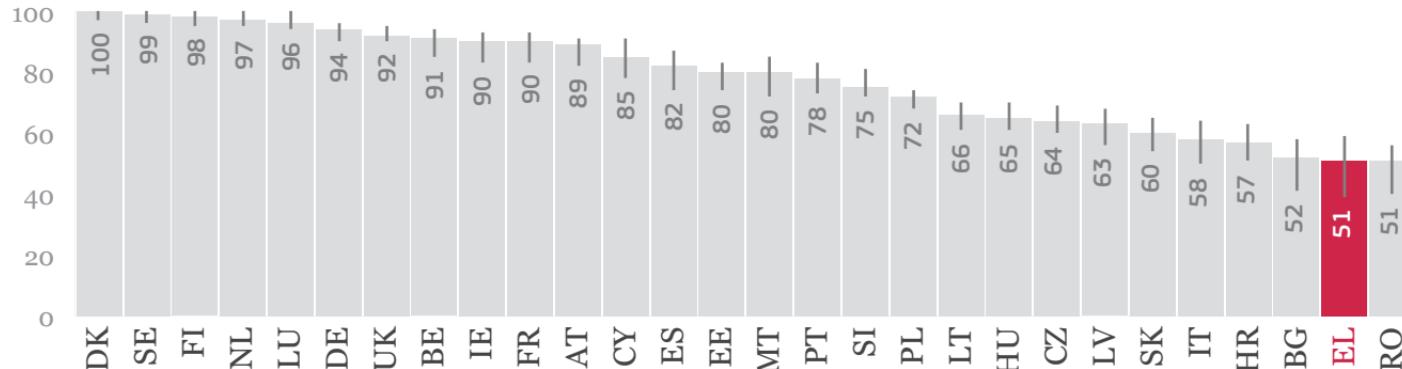
Submitted in Excel.

Transparency International Corruption Perception Index (2013)



Source: [Transparency International](#)

Control of Corruption (percentile rank)



Source: [World Bank governance indicators \(2012 data\) \(215 countries\)](#)

Figure 2

File name/URL:

Algan_Cahuc_Trust_Fig_2_1_bs.pdf

Submitted in Excel.

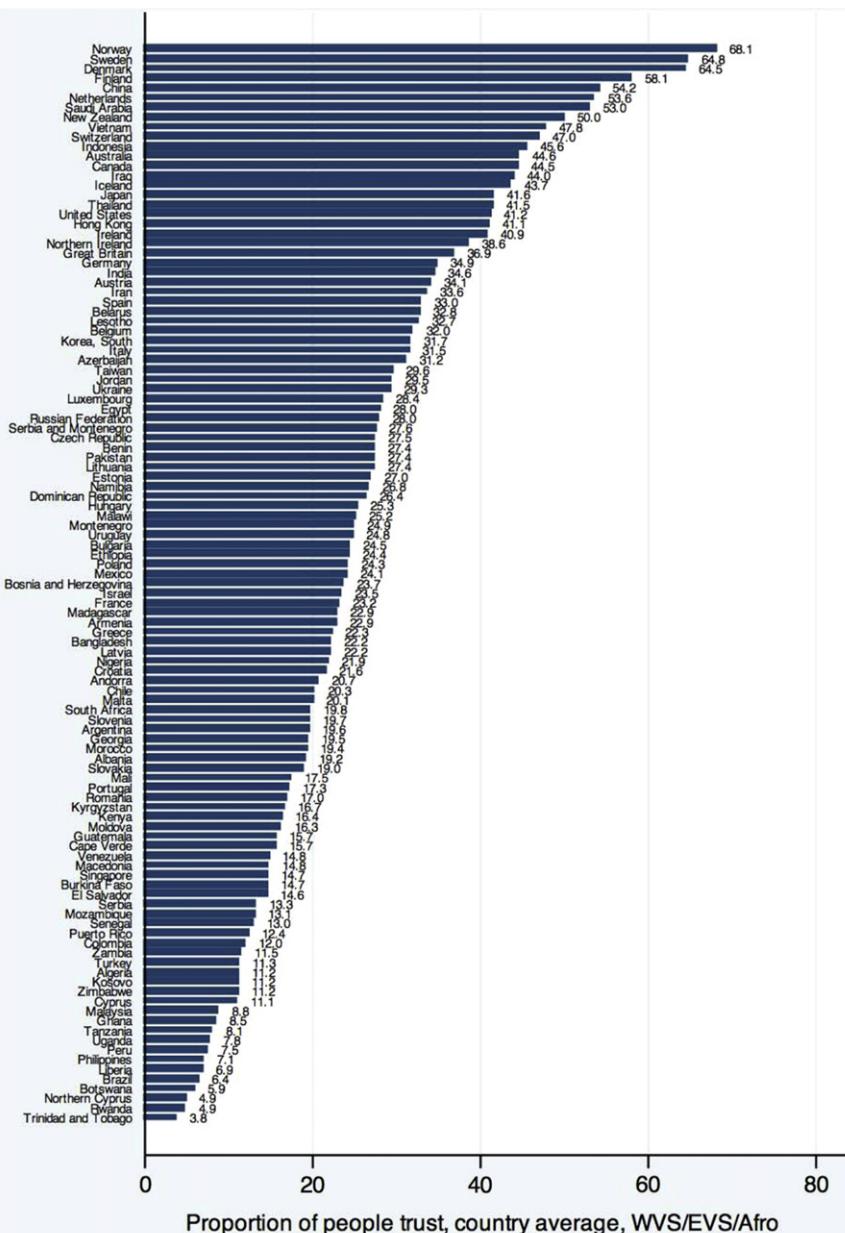
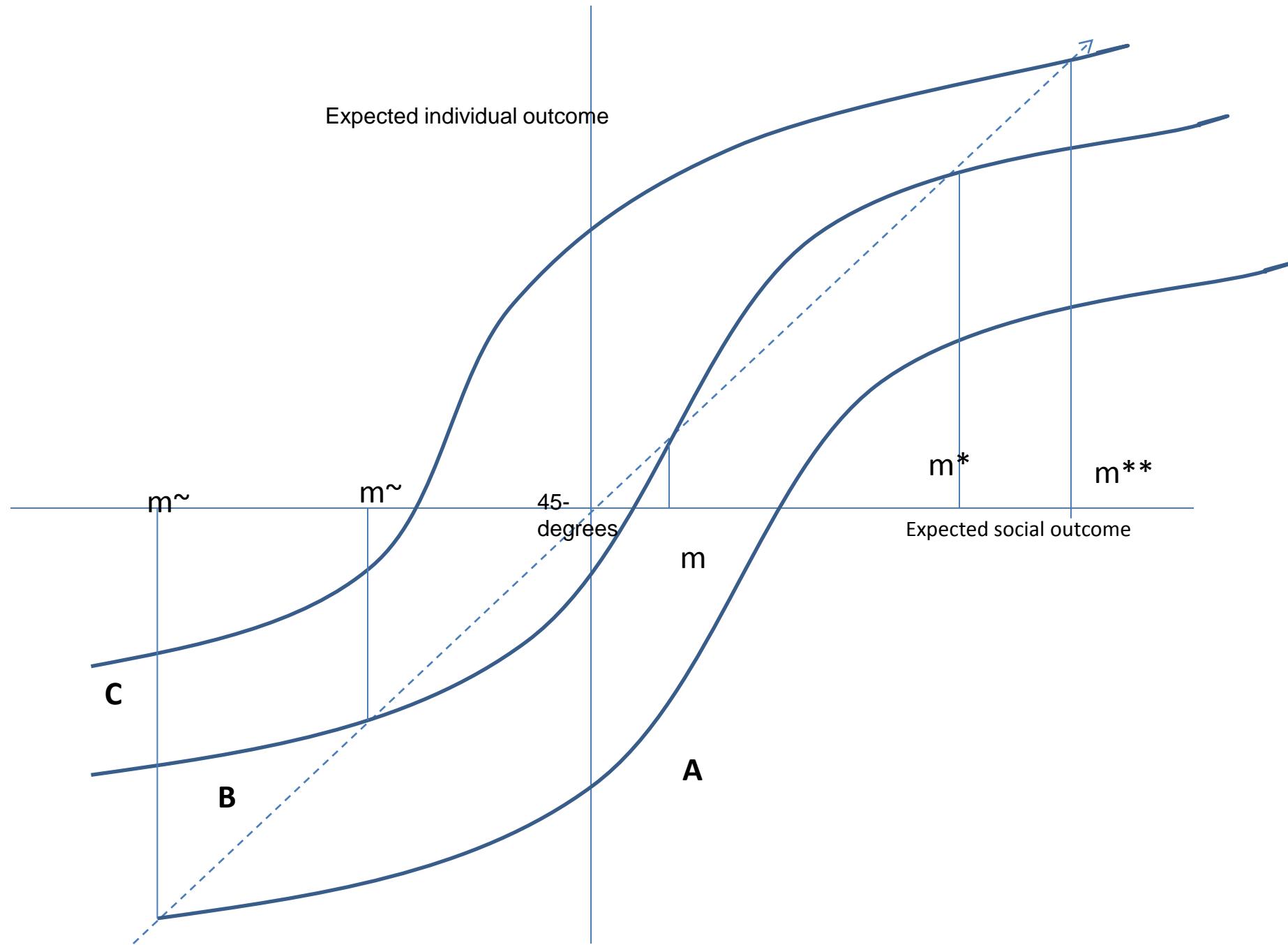


Figure 2.1b Average trust levels in 111 countries. Sources: Trust is computed as the country average from responses to the trust question in the five waves of the World Values Survey (1981–2008), the four waves of the European Values Survey (1981–2008) and the third wave of the Afrobarometer (2005). The question asks “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?” Trust is equal to 1 if the respondent answers “Most people can be trusted” and 0 otherwise.

Figure 3

File name/URL: Azariadis_Ioannides_Figure_3 May_24_2014.pptx

Submitted in pptx.



Endnotes

¹ Earlier version presented at the GreekEconomistsforReform.com Workshop on “Crisis in the Eurozone Periphery and Policy Options for Greece,” May 27-28, 2013, Athens. We are grateful to Adair Morse for some useful tabulations with the Artavanis, Morse and Tsoutsoura data that are referred to herein. We are also grateful to editors C. Meghir, C.A. Pissarides, N. Vettas, and especially to D. Vayanos; to participants at the workshop; to Anna Hardman, Alexandros Kyrtsis, Manos Matsaganis, Elias Papaioannou and John Tsitsiklis for very thoughtful comments, and to Andros Kourtellos for help with data. All errors are ours.

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⁴ http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/organized-crime-and-human-trafficking/corruption/anti-corruption-report/docs/2014_acr_greece_chapter_en.pdf

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⁶ Corruption is defined by the Eurobarometer Survey more broadly as “including, offering, giving, requesting and accepting bribes or kickbacks, valuable gifts and important favours, as well as any abuse of power for private gain.” See Eurobarometer Data, Various Years.

⁷ A particularly egregious practice is the so-called “4:4:2” rule, according to which in dealing with tax liabilities produced by audits, revenue officers authorize a discount of 40%, collect 40% themselves, and let 20% accrue to the Treasury. This practice received notoriety when it was alleged by Professor Diomidis Spinellis, a former tax official during a public

presentation at ELIAMEP, Athens. See

<http://www.tovima.gr/vimamen/guys/article/?aid=447524>. We thank

Alexandros Kyrtsis for this source.

⁸ See <http://www.bbc.co.uk/news/magazine-20874650>. Sites like <http://www.edosafakelaki.org> (“edosa fakelaki” is Greek for “I paid a bribe”) invite anonymous (and eponymous) reports of corrupt practices, but it is unclear at this point what their impact is likely to be. The site www.ipaidabribe.com was set up by Janaagraha NGO, located in Bangalore, India, as a forum for public awareness on corruption in receiving services from the Indian public sector. See Tanaka (2013).

Encouraging signs do appear from time to time in Greece. The fact that the government’s firing of the CEO of the Hellenic Republic Asset Development Fund, apparently for having demonstrated egregious disregard to serious conflict of interest, and the furor it caused in the press, are both hopefully indicative of changing sensitivities, if not attitudes.

⁹ For an evaluation of this relatively new Greek institution to date, see Ladi (2011).

¹⁰ See Eurobarometer Data, Various Years, and Eurobarometer Survey. (2012; 2014).

¹¹ Eleftheriadis (2012) writes in connection with the role of the decline of the press in ‘What Went Wrong with Greece’. “Until 1989 radio and television were a government monopoly. After a series of inconclusive court battles, a group of businessmen started broadcasting terrestrial television programmes. They were effectively stealing the frequencies. The government of the day did not react. Eight stations were given ‘temporary licences’ in 1993. These were renewed in 2007. No permanent regulation has ever been put in place. A senior court ruled in 2010 that the temporary licenses are unconstitutional. The ruling made no difference. The television stations absorbed the print media. Most of them respect no rules for objectivity or moderation. Owner interference is rampant and blatantly favours selected politicians. The press as a whole is not independent, but guided by large business interests.”

The electromagnetic spectrum is supposed, at the Troika’s insistence, to be auctioned off by The Hellenic Republic Asset Development Fund (HRAFD). See <http://www.hradf.com/el/digital-dividend>. As of the time of

writing, legislation confirming renewal of temporary licenses was enacted by the Greek Parliament that was dissolved in December 2014. It has been severely criticized as scandalous by the press and, more importantly, by SYRIZA, the party that won the 2015 parliamentary election. It thus behooves the new government to reconsider the matter urgently.

¹² Artavanis, Morse and Tsoutsoura (2012) use micro data for Greek households, provided by a large private bank in Greece, and work on the premise that the bank makes lending decisions based on the bank's assessment of borrowers' true income, instead of what the respondents report. They replicate the bank's models of credit capacity, credit card limits, and mortgage payments to infer the bank's estimate of individuals' true income. This insight leads to a novel approach to estimate tax evasion by the private sector in Greece. Their estimate of a lower bound of 28 billion euros of unreported income for Greece and the associated tax revenue foregone amounts to 31 percent of the deficit for 2009. Principal tax-evading occupations are doctors, engineers, private tutors, accountants, financial service agents, and lawyers. The authors' evidence

across different industries suggests that industries with low paper trail and industries that are favored by parliament members engage in more tax evasion.

Another look at the Artavanis, Morse and Tsoutsoura data (shared with us privately by Adair Morse) suggests a general pattern of greater tax evasion in rural than in urban areas. This is not so surprising since more salaried workers live in cities than in rural areas, and thus there are fewer opportunities for tax evasion. Generally, the self-employed have higher tax evasion than wage earners (measured by mean tax evaded income), higher median untaxed income and a higher incidence of tax evasion. Their actual income, as imputed by the bank, is 192% of what they report to the tax authorities.

¹³ As estimated by Matsaganis *et al.* underreporting ranges from 22.9% for the lowest decile to 15.9% for the highest decile of the income distribution, while reaching a low of 8% for the mid deciles.

¹⁴ <http://www.youtube.com/watch?v=S5nth5jICP0>

¹⁵ We thank Manos Matsaganis for pointing out to us that tabulations of the 1999 World Values Survey gives a somewhat different and not as stark a picture. The survey asked respondents to rank their attitude to “claiming government benefits to which you are not entitled” on a scale whose values ranged from 1 (never justifiable), to 10 (always justifiable). The average score in Greece was 4.0, compared to 2.1 in Germany. But only 5.1% of respondents in Greece responded that cheating on benefits was always justifiable (score 10), and only 26.1% that it was more justifiable than unjustifiable (scores 6-10). Those were still far higher than the corresponding scores for Germany, 1.4% and 7.4%, respectively.

¹⁶ Hermann *et al.* (2008) report on the following public goods game played by groups of four members: Each member received an endowment of 20 tokens. Participants had to decide how many tokens to keep for themselves and how many to contribute to a group project. Each of the four group members earned 0.4 tokens for each token invested in the project, regardless of whether he or she contributed any. Because the cost of contributing one token in the project was exactly one token whereas the return on that token was only 0.4 tokens, keeping all one’s own tokens was always in any participant’s material self-interest, irrespective of how much the other three group members contributed. Yet, if each group

member retained all of his or her tokens, there were no earnings to be shared, while, each member would earn $0.4 \times 80 = 32$ tokens if each of them invested their entire 20-token endowment.

Two types of experiments, P and N, were conducted and the only difference between the P experiments and the N experiments was that participants in the P experiment could punish fellow group members after they were informed about the others' investments, whereas the N experiments ended after participants were informed about the other group members' contributions. A punishment decision was implemented by assigning the punished member between zero and 10 deduction points. Each deduction point assigned reduced the punished member's earnings by three tokens and cost the punishing member one token. All punishment decisions were made simultaneously. Participants were not informed about who punished them. Punishments were for both low contributors (free riders) as well as high contributors, which the authors label as antisocial punishment.

¹⁷ For a definition see:

http://www.slang.gr/lemma/show/xalao_tin_piatsa_19179.

¹⁸ A full analytical justification of these possibilities, using social interactions theory, may be found in the authors' technical appendix; see below.

¹⁹ We thank Elias Papaioannou for bringing to our attention the successful experience of Brazil with random audits. Ferraz and Finan (2008) show that random audits of Brazilian municipalities on their spending of federal transfers and subsequent disclosure of results to media sources had significant effects on election outcomes. Using a data set on corruption constructed from the audit reports, they compare the electoral outcomes of municipalities audited before versus after the 2004 elections, with the same levels of reported corruption. They show that the release of the audit outcomes had a significant impact on incumbents' electoral performance, especially where the electorate was more informed because of presence of local radio stations.

²⁰ See Korobow, Johnson and Axtell (2007). As they put it, "if in fact most crime does have an element of social interaction as its cause, then it would not be unreasonable to conclude that, since tax evasion is a crime, evasion has social drivers as well."

²¹ Alm (2012) in the latest review of research on tax evasion does discuss briefly works in the “social interactions theory” strand, p. 13, but he too is stymied by the lack of empirical research.

²² The four fictitious groups were defined as follows: one (two) made up of those who were told they lived in a fictitious country run by a high (alternatively, low) trust government; and three (four) where tax authorities had high (alternatively, low) power to enforce tax laws. All subjects were asked the following questions: “How likely is it that you will fill in your tax return honestly?” “How much of your yearly income would you declare completely honestly?” “Generally speaking, tax evasion is never justified, always justified or something in between?” They asked additional questions pertaining to individual characteristics (age, income, and gender), which were treated as independent variables.

²³ We are grateful for detailed comments and suggestions by Manos Matsaganis, Elias Papaioannou and John Tsitsiklis that helped us shape this section.

²⁴ See discussion of the so-called 4:4:2 rule in footnote 7 above.

²⁵ Lest it be thought that we are involving a maximalist approach here, we wish to direct attention to the consequences of values inculcated

at the Greek home, at least as seen via data. The research on distrust shows that a measured distrust index is negatively correlated with the importance parents assign to children's being taught "tolerance and respect" See Aghion, Algan, Cahuc and Shleifer (2010). In fact, Fig. 28, *ibid.*, shows that Greece is an outlier, lowest on tolerance and respect, and highest in distrust.

²⁶ We thank Manos Matsaganis for emphasizing this point, but he is not responsible for the phrasing of this point here.

²⁷ The term for the European Commission's Task Force for Greece is, of the time of writing, not yet renewed and might be allowed to expire. This is unfortunate, because here we have a pan-European effort at providing technical assistance to Greece, to which even tiny Iceland, a country one-fourtieth of Greece, has contributed. For its latest (and last?) report, see

http://europa.eu/rapid/press-release_MEMO-14-495_en.htm

²⁸ http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/organized-crime-and-human-trafficking/corruption/anti-corruption-report/docs/2014_acr_greece_chapter_en.pdf

²⁹ As reported by the *New York Times*, December 8, 2011:

<http://www.nytimes.com/2011/12/08/us/blagojevich-expresses-remorse-in-courtroom-speech.html>

Mr. Rod Blagojevich was sentenced to 14 years in prison on his 18 corruption counts, that included wire fraud, attempted extortion, conspiracy to solicit bribes and notably trying to sell or trade the U.S. Senate seat that became vacant when U.S. Senator Barack Obama was elected US president in Fall 2008.

³⁰ We thank Elias Papioannou for bringing this fact to our attention.

³¹ See Ladi (2011) for an assessment of the Greek case, which is arguably a success.

³² The importance of independent authorities is underscored by Paul Romer [Romer (2010)] in the case of Hong Kong, which succeeded in stamping out corruption during the waning years of British rule, while it was administered by a governor appointed by the British government.

Modeling the Role of Social Interactions in Antisocial Behavior

Technical Appendix to:

Thinking about Corruption in Greece¹

Costas Azariadis and Yannis M. Ioannides²

February 20, 2015

1 Introduction

In this appendix we approach corrupt practices as outcomes of decisions in a social context. One can distinguish conceptually among pure individual propensity towards corruption, other things being equal, and the externality effect that corrupt action by others has on each individual. Greek citizens normally observe corrupt practices at varying degrees, and such observations may feed perceptions that “corruption pays.” In fact, the widely used Corruption Index of Transparency International³ is based on reported perceptions. So, the important question to put to a model is: When does the widespread perception of corruption becomes corruption?

This question can be modeled by the social interactions literature. In a standard formulation, [see Brock and Durlauf (2001), Durlauf and Ioannides (2010), and Ioannides (2013), Ch. 2], aggregate behaviors such as corrupt practices and tax evasion emerge through interactions in a population. It is possible that different occupational groups have different exposure to practices. In such a model imposing self-consistency (in effect the counterpart here of rational expectations) in a manner which connects the expected behavior of the typical agent in a nonlinear fashion with the perceptions of corruption, leads in general to multiple equilibria in actual corruption. This means that different subgroups of the population may cluster into different practices, some at low levels of corruption and others at

¹Submitted to: Meghir, C., C. A. Pissarides, D. Vayanos and N. Vettas, eds. *Crisis in the Eurozone Periphery: Policy Options for Greece*, MIT Press, 2015.

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³<http://www.transparency.org/cpi2012/results>

higher ones, which are typically stable, and the middle level ones are typically unstable.

For the perception of corruption not to translate into actual corruption individuals must feel incentives not to conform to social perceptions of corruption and of other practices and thus in effect not to “coordinate” on the worst outcomes (which is loosely speaking here, because a Bayes-Nash equilibrium is invoked). Appropriate incentives can be studied on the basis of the model introduced in this appendix. Some of them are discussed informally in the main part of the paper. These incentives must include individual enforcement mechanisms, like legal and administrative sanctions, as well as socially integrated ones, like stigma.

This appendix offers a model which underlies the narrative exposition in the main text. A key result of the model identifies actual practices as emerging as social equilibria. One can base policy design on such foundations, where policy does not just bring about a marginal reduction of corruption but moves the economy to a completely different equilibrium. This is a feature of non-uniqueness, which is particularly attractive in the context of Greece, where it is highly desirable to overturn the impact of expectations that things will go unchanged.

2 Model

Corruption practices can be very different and can adapt to specific cultural features of given societies. So, a very general model is called for. We borrow from Durlauf and Ioannides (2010) a basic model of social interactions that involves decisions over a discrete set of choices. It aims at capturing many of the interesting implications of integrating feedback from social factors and conditions into individual behavior.

Consider a population of I individuals each of whom chooses between L different alternatives; individual choices are denoted by ω_i , and the choice set is: $S = \{0, 1, \dots, L - 1\}$. Each agent i is associated with a group $g(i)$, which is defined as those members of the population whose behaviors and characteristics enter as direct arguments in i 's decision problem. For example, different groups of the population may have different options in engaging in corrupt practices. Whereas everyone deals with providers of public services of different kinds,

depending on their nature of the incomes, individuals have different options in engaging in tax evasion or even (legal) tax avoidance. Those on salary, wage or pension incomes have income taxes withheld at source. Self-employed individuals can be small shopkeepers with more or less visible business practices, or lawyers with access to information regarding the risk associated with different modes of tax compliance. We start by assuming that each actor is a member of a single group. We describe how social interactions affect individual and aggregate outcomes regarding specific practices.

Each of the possible choices ℓ produces utility $V_{i,\ell}$ for individual i . We conceptualize choice-specific utility as having three distinct components. The first, $h_{i,\ell}$, is *private deterministic utility*. It is private in that it does not exhibit direct dependence on the choices of others and is deterministic as it is treated as known to the modeler; in econometric work this is operationalized by assuming that it is a known function of observables and estimable parameters. The second component is *deterministic social utility* and captures the dependence of individual i 's utility on specific choice by others. If individual i chooses $\omega_i = \ell$ and j chooses $\omega_j = s$, then individual i receives $J_{i,j,\ell,s}$. For example, a young aspiring lawyer cannot be seen driving other than a sparkling BMW. This is quite general as each pair of individuals and pair of choices is assigned a separate payoff. The payoffs will be restricted in order to produce tractable results. We assume that the payoffs from the choices of others are additive and so are both deterministic private and social utility. A third component is a *random utility* term, $\epsilon_{i,\ell}$. These random utility components are assumed to be independent across choices and individuals; this assumption can be relaxed in a straightforward way (e.g., by the nested logit model, as we see further below).

Together, these three components are summed so that

$$V_{i,\ell} = \mathcal{E}\{V_{i,\ell}\} + \epsilon_{i,\ell},$$

with the expected utility taking the form:

$$\mathcal{E}\{V_{i,\ell}\} = h_{i,\ell} + \sum_{s=0}^{L-1} \sum_{j \neq i} J_{i,j,\ell,s} p_{j,s|i}^e, \quad (1)$$

where $p_{j,s|i}^e$ denotes the probability i assigns to choice s on the part of j . For example, individual i is not sure whether individual j tax evades, say chooses $\omega_j = s$, but thinks that

is so with probability $p_{j,s|i}^e$. In the language of Transparency International, it is i 's perception that individual j tax evades. For later use, we define \mathbf{J} as the array of interaction coefficients, an $I \times I \times L \times L$ array with element $J_{i,j,\ell,s}$, and \mathbf{I} as the $I \times I$ identity matrix.

This expected utility function allows for an explicit characterization of the equilibrium choice probabilities once the probability distributions for the random utility terms is specified. We assume that the $\epsilon_{i,\ell}$'s are distributed according to the multinomial logit model with mean zero and dispersion parameter ς . The variance is given by $\frac{\pi^2}{\varsigma^2}$. Individual i 's choice probabilities are given by:

$$\text{Prob}(\omega_i = \ell) = p_{i,\ell} = \frac{\exp \left[\varsigma \left(h_{i,\ell} + \sum_{s=0}^{L-1} \sum_{j \neq i} J_{i,j,\ell,s} p_{j,s|i}^e \right) \right]}{\sum_{\ell'=0}^{L-1} \exp \left[\varsigma \left(h_{i,\ell'} + \sum_{s=0}^{L-1} \sum_{j \neq i} J_{i,j,\ell',s} p_{j,s|i}^e \right) \right]}, \ell \in S, i = 1, \dots, I. \quad (2)$$

Higher ς implies lower variance. The case of $\varsigma = 0$ implies purely random choice, where all outcomes are equally likely because the private random utility density is so diffused that the maximum of the random utility shocks will control the choice. In contrast $\varsigma = \infty$ means that choices are deterministic in the sense that the private random utility terms are all equal to 0 with probability 1.

Self-consistency of beliefs requires that beliefs are validated at equilibrium, that is, perception of corruption is confirmed. For this model we require that

$$\text{Prob}(\omega_i = \ell) = p_{i,\ell} = \frac{\exp \left[\varsigma \left(h_{i,\ell} + \sum_{s=0}^{L-1} \sum_{j \neq i} J_{i,j,\ell,s} p_{j,s} \right) \right]}{\sum_{\ell'=0}^{L-1} \exp \left[\varsigma \left(h_{i,\ell'} + \sum_{s=0}^{L-1} \sum_{j \neq i} J_{i,j,\ell',s} p_{j,s} \right) \right]}, \ell \in S, i = 1, \dots, I. \quad (3)$$

It is straightforward to verify that under the Brouwer fixed point theorem, at least one such fixed point exists for each of individual i 's choice probabilities. Equation (3) defines $L - 1$ independent equations for each individual's *equilibrium* beliefs, and an additional one follows by the need for probabilities to sum up to one. Thus, the matrix $p_{i,\ell}$, $i = 1, \dots, I, \ell = 0, L-1$, of all individuals' *equilibrium* beliefs is determined, although multiple equilibria are possible. We can think of different individuals as representative of different groups of the population. For example, the different tax evading behaviors of the groups identified in the study by Artavanis, Morse and Tsoutsoura (2012) can be analyzed fully.

A simple though still interesting case, that is commonly explored in the social interactions literature, is to simplify the interaction structure by restricting social utility so that each

individual only cares about the fraction of the entire population making the same choice he does. This renders the agent indifferent as to who makes the choices within the economy — individuals are anonymous. What particular choices others make is irrelevant to an individual who believes that shameless tax evasion is practiced by all. Under this simplification, the object of interest is not the matrix with elements $p_{i,\ell}$, the individual choice probabilities, but rather the aggregate choice probabilities, $p_\ell = I^{-1} \sum_i p_{i,\ell}$. This leads to:

$$p_\ell^e = p_\ell = \frac{1}{I} \sum_i \frac{\exp [\varsigma (h_{i,\ell} + J_{i,\ell} p_\ell)]}{\sum_{s=0}^{L-1} \exp [\varsigma (h_{i,s} + J_{i,s} p_s)]}, \quad \ell \in S, \quad (4)$$

where $J_{i,\ell}$ is the social utility weight i assigns to the share among the population of others making the choice ℓ .

2.1 Binary Choice

Simplifying further, let us assume that the choice set is binary, say `tax evade` or `not tax evade`. In that case, we can without loss of generality define the choice set as $\{1, -1\}$. The convenience of this definition will be shown shortly. We proceed under the assumption that social utility, $\sum_{j \neq i} J_{i,j,\ell,s} p_{j,s|i}^e$ in (1), is a function of the *expected average choice* of others, i.e. $\sum_{j \neq i} J_{i,j} m_{i,j}^e$,⁴ where

$$m_{i,j}^e = 1 \times p_{j,1|i}^e + (-1) \times p_{j,-1|i}^e, \quad (5)$$

and make the additional assumption of *self-consistency of beliefs*, that is, individual i 's perception of individual j 's tax evading is validated at equilibrium:

$$m_j = m_{i,j}^e.$$

Let \mathbf{m} denote the I -vector with the m_j 's as elements. In this case, it is convenient to

⁴It is easy to see this as a specification of \mathbf{J} in (1) above. That is, by going back to the original notation of equation (1) and setting $J_{i,j,\ell,1} = J_{ij}$, $J_{i,j,\ell,-1} = -J_{ij}$, then

$$\sum_{j \neq i} J_{i,j,\ell,s} p_{j,s|i}^e = \sum_j J_{ij} m_j.$$

use the hyperbolic tangent function,

$$\tanh(x) := \frac{\exp(x) - \exp(-x)}{\exp(x) + \exp(-x)}, \quad -\infty < x < \infty, \quad \tanh(x) \in (-1, 1).$$

We rewrite (3) as:

$$m_i = \tanh[\varsigma h_i + \varsigma \mathbf{J}_i \mathbf{m}], \quad i = 1, \dots, I, \quad (6)$$

where $h_i = h_{i,1} - h_{i,-1}$, and \mathbf{J}_i denotes the i th row of the array, now a matrix, of interaction coefficients J_{ij} . Brouwer's fixed point theorem guarantees that the system of social interactions with an interactions matrix \mathbf{J} admits an equilibrium that satisfies (6).

To understand the properties of the binary choice model, we consider the case where all heterogeneity across agents is due to random utility, i.e. we assume that $h_{i,\ell}$, and $J_{i,\ell}$, are constant across agents. This implies $\mathcal{E}_i\{\omega_j\} = m$, for all individuals, so that the Nash equilibria associated with (6) simplify to

$$m = \tanh(\varsigma h + \varsigma Jm). \quad (7)$$

The properties of this special case are straightforward to describe. Referring to Fig. 3, the model of this section suggests three cases, in general. First, if $\varsigma J > 1$, and $h = 0$, then the function $\tanh(\varsigma h + \varsigma Jm)$ is centered at $m = 0$, its slope at that point exceeds one, and equation (7) has three roots: a positive one ("upper"), (m_+^*) , zero ("middle"), and a negative one ("lower"), (m_-^*) , where $m_+^* = |m_-^*|$. In this case, private deterministic utility does not favor either choice. A situation where individuals believe either choice is chosen with equal probability is confirmed purely because of the statistical dispersion of the unobservable component of utility. However, the condition $\varsigma J > 1$, equivalently written as $J > \frac{1}{\varsigma}$, can be interpreted as saying that the social interactions coefficient is strong enough relative to the dispersion of the unobservable component of utility to induce an outcome where the belief that in the average many individuals tax evade, $m_+^* \geq 0$, (alternatively, few individuals tax evade, $m_+^* < 0$) becomes self-fulfilling. The symmetry, $m_+^* = |m_-^*|$, is of course an outcome of the analytics of the special case of equation (7) $h = 0$.

Second, if $h \neq 0$, and $J > 0$, then the inherent attractiveness, if $h > 0$, (or lack thereof, if $h < 0$) of either choice as expressed by the private utility component, if individuals are

conformist (positive social interactions coefficient), then there exists a threshold H^* , which depends on ς and J , such that if $\varsigma h < H^*$, equation (7) has a unique root, which agrees with h in sign. This is depicted by curves A and C, Fig. 3. In other words, given a private utility difference h , say in favor of tax evading (because it leaves everyone with higher after tax income), given fundamentals, and a sufficiently large dispersion of the random utility component (that is, there are many individuals with large enough unobserved propensity to disobey the tax laws $h < H^* \frac{1}{\varsigma}$), the random component dominates choice in the direction indicated by the sign of inherent attractiveness. These are depicted by points $m = m^{\tilde{v}}$ and $m = m^{**}$. If, on the other hand, $h > H^* \frac{1}{\varsigma}$, then equation (7) has three roots: one with the same sign as h , and the others of the opposite sign. See Fig. 3, Curve B. That is, given a private utility difference, if the dispersion of the random utility component is small, $h > H^* \frac{1}{\varsigma}$, then the social component dominates choice and is capable of producing multiplicity in conformist behavior.

Third, if $h \neq 0$ and anti-conformist behavior, $J < 0$, then there is a unique equilibrium that agrees with h in sign. That is, for any given level of deterministic utility, beliefs that others engage in tax evasion will induce behavior in the opposite direction. So, the stronger is the inherent attractiveness of tax evasion, the lower the probability that others would engage in it. Very high such attractiveness will elicit self-confirming behavior in spite of non-conformism. Uniqueness follows because as the expectation of engaging in tax evasion increases, the likelihood that a particular individual engages in it decreases. For the purpose of simplicity, this possibility is not depicted on Fig. 3, but it would be represented by a sigmoid but downwards sloping curve.

The intuition of relationship between the number of equilibria and the parameters J, h , and ς can be summarized as follows. Holding ς constant, it is not surprising that multiple equilibria emerge when the strength of the externality (here taking the form of conformity effects), measured by J , is large relative to the strength of inherent attractiveness as privately evaluated by the individual, measured by h . The role of ς is more subtle. The parameter ς measures the degree of heterogeneity in payoffs across individuals in the population. Higher ς means smaller heterogeneity. The degree of heterogeneity, in turn, determines how private

and social incentives interact to produce equilibria. When ς is small, which means that dispersion of unobservable propensity is large, then relatively large fractions of the population will experience draws such that either $\epsilon_{i,\ell} - \epsilon_{i,\ell'}$ or $\epsilon_{i,\ell'} - \epsilon_{i,\ell}$ is large. This means in turn that a relatively high fraction will have their decisions overwhelmingly influenced by their idiosyncratic payoffs in the sense that the realization of the idiosyncratic part of the payoffs is large enough that it dominates the common private and social incentives. By symmetry of the density for $\epsilon_{i,\ell} - \epsilon_{i,\ell'}$, equal percentages of the population, in expectation, will make choices 1 and -1 because their payoffs are dominated by the idiosyncratic terms. But this means that a relatively small percentage of the population remains that can engage in self-consistent conformism because of social utility effects. Put differently, when enough agents make choices driven by symmetrically distributed payoff differences, the magnitude of the social utility terms is reduced, since it restricts the m term in Jm .

3 Uses of the Model

The model we study makes several policy-related suggestions. One is to assess whether multiplicity in the observed outcomes of tax evasion or corrupt behavior is more likely in certain settings and try to relate that to the structure of the model. For example, in its most general setting, as expressed by (2) and (3), the model may be used to study tax evasion behavior by different groups of the population. The groups may be defined as different income groups or as different occupations, where it is presumed that the members of the groups are in social contact with one another. Estimating the model with data from different cities or regions can be used to guide allocation of resources for enforcement. The simple binary choice model may be used to study tax evasion behavior across countries. The empirical tax evasion literature may be used to guide selection of regressors, either with individual or aggregate data.

The presence of multiple equilibria also poses interesting questions about enforcement. That is, can enforcement be designed so that individuals are induced to move away from low-compliance to high-compliance equilibria. Note that the macroeconomic effects of such

a change in compliance can be orders of magnitude bigger than changes in marginal tax rates or other features of tax policy. The good news here is that the better of the two good equilibria, say the one associated with high compliance, is stable; the bad news is that the bad equilibrium, too, is stable. Thus, the policy must be substantial enough to move the economy from the bad to the good equilibrium, but not to drastic so as to blunt individual incentives. The model can deliver this basic intuition as follows.

Let us define as $h_{i,+1}$ ($h_{i,-1}$), individual's i private deterministic utility when he complies (does not comply) with tax laws. To simplify the problem (at the risk of abusing the model), we assume that the h_i 's are given by an expected subutility under the respective regime. Following the classical formulation of Allingham and Sandmo (1972), let Y_i be income, t_i the corresponding tax rate, and β_i the share of income that i declares to the tax authorities, which we will refer to as the level of compliance. The individual is not audited with probability $1 - p_i$, in which case his after-tax income is $(1 - t_i\beta_i)Y_i$; he is audited with probability p_i , in which case, the actual income is determined and he pays the tax on the declared income, plus the tax along with a penalty, θ , on the evaded tax, so that his after tax income is: $Y_i - t_i\beta_i Y_i - (1 + \theta)t_i(1 - \beta_i)Y_i$, where $\theta > t_i$. To fix ideas, let's limit consideration to either full compliance, $\beta_i = 1$, or total non-compliance, $\beta_i = 0$, and assume that the individual's subutility associated with the tax system is the log of after-tax income. Thus compliance versus non-compliance depends on the comparison of the following quantities, treated for simplicity as deterministic utility from compliance, $h_{i,+1} = \ln[(1 - t_i)Y_i]$, and utility from non-compliance, $h_{i,-1} = (1 - p_i)\ln Y_i + p_i \ln[(1 - (1 + \theta)t_i)Y_i]$. Therefore, individual i chooses compliance if:

$$\left[\frac{\ln(1 - t_i)}{\ln(1 - (1 + \theta)t_i)} \right] \leq p_i.$$

So, the higher p_i , the audit probability, or the higher θ , the penalty, the higher the probability of compliance.

In general, the audit probability depends on income and perhaps its composition as well, which introduces another layer of richness in the above comparison. But most significantly, individuals might not know their actual audit probability, and may infer through their social connections, perhaps on the basis of experiences of others, such as friends or professional

acquaintances. This introduces a social element into individuals' decisions, which in the terminology of the social interactions literature would be a contextual effect.

More consequential in terms of outcomes, however, is if individuals are sensitive to the compliance behavior of their social contacts. Suppose individuals are conformist and value their expectation of the compliance behavior of others. This brings us back to the model of section 2.1 above. If individual i complies, he enjoys income $(1 - t_i)Y_i$, regardless of whether or not he is audited. If he does not comply, he may be audited with probability p_i , and enjoys income $(1 - (1 + \theta)t_i)Y_i$, or not audited with probability $1 - p_i$, in which case he enjoys income Y_i . So, conditional on non-compliance, the expected income is equal to $p_i[(1 - (1 + \theta)t_i)]Y_i + (1 - p_i)Y_i$. Defining h_i as expected difference in incomes under compliance relative to non-compliance, we have:

$$h_i = h_{i,+1} - h_{i,-1} = t_i Y_i [p_i \theta - (1 - p_i)].$$

Rewriting (7) we have:

$$m = \tanh(\varsigma t_i Y_i [p_i \theta - (1 - p_i)] + \varsigma J m). \quad (8)$$

Conformism is expressed by the presence of a positive effect of m , expected compliance, in the utility comparison. Recall that in this case, we may have, in general, a unique equilibrium or three equilibria. See Figure 3. If h_i is small relative to the threshold $\frac{H^*}{\varsigma}$, and expresses that non-compliance is inherently more attractive, then there will be a unique equilibrium agreeing in sign with h_i , m_- . That is, the inherent attractiveness of non-compliance prevails. This is mapped by curve A, Figure 3. In such a case, improvement in enforcement, either by means of more likely audits, that is higher p_i , and/or larger penalties, higher θ , can increase the inherent attractiveness of compliance. However, they need to be drastic enough to overcome the threshold, so that h_i becomes greater than $\frac{H^*}{\varsigma}$. In that case, the map of $\tanh(\varsigma h_i + \varsigma J m)$ shifts up to curve B, Figure 3. If the increase in the attractiveness of compliance is large enough, then the map becomes like curve C, Figure 3, and the economy shifts to m^{**} . This line of reasoning illustrates that timid enforcement can lessen non-compliance, like moving the curve A insufficiently higher to allow for three equilibria, and still affecting equilibrium

non-compliance However, it is sufficiently vigorous enforcement that allows the economy to avail itself of a unique good equilibrium with compliance, m^{**} .

Finally, we note that in the context of the previous example (see (8 above), if $p_i > (<)(1 + \theta)^{-1}$, then individuals with higher (lower) incomes and/or those facing higher (lower) tax rates are more likely to comply.

4 Empirical Application with Eurobarometer Data

The main part of the paper discusses and the Box presents in more detail results from an empirical study, based the Eurobarometer survey data. The Eurobarometer has conducted starting in 2005 biennial surveys (for years 2005, 2007, 2009, 2011, 2013) of the attitudes of the publics of the EU countries by means of a large number of questions. These surveys are an official activity of the European Commission; see Eurobarometer Data, Various Years. The latest available micro data are for 2013 and the samples are roughly 1000 observations from each EU country, amounting to a maximum total of 26856. We interpret as perception of corruption the following question (2011, QC4): “In (our country), do you think that the giving and the taking of bribes, and the abuse of positions of power for personal gain, are widespread among any of the following?” The categories listed range from among people working in the police services, customs, the judiciary, politicians at various levels, official awarding tenders, or permits, people working in the public education or the public health sectors to inspectors in health, construction, food quality, sanitary control and licensing. We recode the micro data as the sum of affirmative responses under these categories into a categorical variable ranging from 0 to 13. We interpret as experience of corruption the following question (2011, QC5): “Over the last 12 months, has anyone (in our country) asked you, or expected you, to pay a bribe for his or her services?” We recoded the micro data as a categorical variable, that is equal to 0, if the answer is “no, nobody did,” or equal to 1, if the answer is at least one in the above categories.

After much experimentation with different empirical models, we performed an ordered logit regression with the experience of corruption as a dependent variable, and perception

of corruption as an explanatory variable, along with a country dummy for each of the EU countries, while allowing for 13 discrete thresholds, to be estimated, plus a large number of explanatory variables based on individual demographics. The thresholds allow naturally for the nonlinearity associated with the increasing severity of corruption experienced by respondents. Moreover, the ordered logit model, which depicts the likelihood for different outcomes through the cumulative of the logistic function as a function of respondents' perception, matches the intuition of the model introduced in section 2.1 for binary choice. It differs only in allowing for more categories. The main part of the paper and Ioannides and Murthy (2014) provide more details.