

# THE COST OF ADMINISTRATIVE FRICTIONAL TAXES IN MAJOR UNDERGROUND INFRASTRUCTURE

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## ABSTRACT

*Building cost-effective major underground infrastructure underpins economic growth and prosperity. The ultimate cost of underground infrastructure includes unique local expenses. Some of these costs may simply be a result of inherent local idiosyncrasies but others may result from an abrogation of the obligations on government to administer power responsibly. Where poor governance is the cause of these costs, they may rightly be considered a tax and in some circumstances may even promote, entrench or contribute to modern forms of corruption. This paper explores the likely magnitude of these local additional frictional costs - and examines the potential impact of government action to minimize them on the final cost. It is noted that the countries in most need of underground infrastructure typically have the poorest credit ratings, highest interest rates, and lowest incomes. Governments are uniquely placed to regulate and enforce measures to minimize these frictional taxes to protect the value of expensive underground infrastructure by minimizing unnecessary expenses, maximize project value and reduce the likelihood of corruption and intergenerational debt.*

***Note:** This paper is prepared in good faith to demonstrate the likely scale of the cost of Frictional Taxes and the value to countries of minimising Frictional Taxes in all forms. The views expressed in this paper are those of the author.*

**Keywords:** Administrative Frictional Taxes, Project Costs, Risk, Social Justice, Underground Infrastructure

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## 1. INTRODUCTION

All underground infrastructure has a basic cost or value for its construction, maintenance and operation. An examination of the causes of higher than expected actual costs reveals a raft of project risks which contribute to the increasingly high cost of constructing and maintaining underground works. These extras include ‘*Administrative Frictional Taxes*’ that collectively

impose a potentially large surcharge to the basic costs that is highest on the citizens of countries that can least afford it and is a modern form of government controlled corruption.

Corruption itself has long been identified as one of the key enemies of civilisation and civil society as we know it. [1] Corruption undermines the relationship between citizens, and between citizens and the State, yet, these administrative frictional taxes are uniquely within the State's control and are thereby readily minimised. A failure to robustly exercise executive power to actively manage these taxes – to minimise them from the outset and regulate them as they emerge - is a costly abrogation of the unique power of the State to maximise value and benefits for its citizens of major projects.

There is no simple definition of '*Administrative Frictional Taxes*' – they are a phenomenon not an object, and, include traditional corruption. The scale of subsurface enterprises is so large, it often impacts multiple country's State and private institutions. In the past these taxes were identified simplistically by practices such as 'pay to play' bribery, but today may involve intricate and complex manipulations of processes such as contract award, supply chain manipulation, development approvals, enabling work permits, authorities to undertake activities, energy, utilities and their approvals, environmental licencing and product disposals, fire safety, and labour hire arrangements - the opportunities for frictional taxes to flourish are almost boundless.

Subsurface infrastructure projects are often so large and extensive that the frictional taxes can compose a large proportion of the cost of the infrastructure thereby reducing its real value and compromising its functionality and quality. These frictional tax burdens can affect multiple generations of users and citizens by imposing disproportionate frictional tax driven debt.

Country credit ratings, GDP variations and local attitudes towards Frictional Taxes mean that not only is the burden of frictional taxes not spread equally, but often those people least able to resist corruption are those who pay the burden, often inheriting the debt from corrupt practices generations before.

The existence of Frictional Taxes is hidden in plain view and should be acknowledged and managed. There is an apparent correlation between the level of Frictional Taxes in a country, degraded sovereign credit ratings and inflated infrastructure prices.

## **2. COST EFFICIENCIES**

For any substantial underground infrastructure project there is an efficient world price and a local price. When there is a wedge between the two, the economic cost of that wedge can be regarded as a tax on the final user, or for a public project, the community as a whole.

That wedge may just be raw inefficiency – Governments/planners/builders do not always achieve cost minimization on every project for all sorts of reasons. Perhaps the largest inefficiency here is going to market prematurely and thereby introducing inherent project uncertainty. Another source of inefficiency is ineffective government regulation from the perspective of the citizens of the State. Ineffective government regulation can distort the administration of a project for the benefit of individuals or organisations. This distortion can often be regarded as corruption because it intentionally disturbs the economy of a project for the benefit of third parties and is a source of inefficiency. This is corruption when an intermediary (of some kind) is able to appropriate part of the surplus between the local price and the world price by manipulating the action (or inaction) of the local government.

Most often this corruption is driven by the executive of elected governments failure to exercise its power, or worse, exercising its power in a way that entrenches the corrupt practices divesting the surplus to the disbenefit of the community.

The capability to appropriate that surplus can have many guises ranging from poor governance and misadministration to outright crime of all sorts.

### 3. CORRUPTION ANTIQUITY

It has long been recognised that corruption in its' simple and most widely expressed form is inherent in the administration of power, especially by those entrusted with the administration of States and their resources. As noted by Plato in The Republic:

[An honest man knows that]: *“No one ... ever acts honestly in the administration of States. [An honest man in State administration] ... would be like a man who has fallen among wild beasts – unable to join in the wickedness of his fellows, neither would he be able alone to resist all their fierce natures, and therefore he would be of no use ... ”*[2]

All major religions take a strong position against simple corruption and the importance of not engaging in corrupt activities. In the Gospel of St Paul in the New Testament [3]; the Jewish Talmudic Law [4]; Ancient India [5]; early Muhammadan Tradition [6] there is a common theme aligns with that stated by the Prophet Muhammad:

*“God’s curse is to rest upon the giver of bribes, the taker of bribes, and the go-betweenes”.* [7]

### 4. THE WORLD BANK

The World Bank also condemns corruption:

*“Corruption has a disproportionate impact on the poor and most vulnerable, increasing costs and reducing access to services, including health, education and justice...As demand for effective service delivery, good infrastructure, and fair institutions continues to rise, it is vital that governments use scarce resources as efficiently and transparently as possible,”* World Bank Group, President Jim Yong Kim, 2017 [8]

The World Bank believes there is no simple solution for fighting corruption, instead it suggests we all have a role to play. [9] [10]

In the context of our subsurface infrastructure projects these generalised statements about corruption are naïve. In the 21<sup>st</sup> Century the mechanisms for unjustly enriching the few to the disadvantage of the many are highly complex, obscured in respectable transactions, entrenched by regulation and procedure, and for the most part flourish in plain view. As was the case historically, Corruption Taxes are always aligned to the administration of power, approvals, commerce, supply chains and governance.

Through the collective voice of allied underground professionals there are opportunities to develop thought and behavioural leadership, that contribute to the global reduction in Administrative Frictional Taxes, substantially reducing the cost of our projects for the benefit of our industry and mankind.

Underground infrastructure projects are so large and encompass such a broad range of activities, that even modest reductions in frictional tax practices may have tangible impacts on project costs and associated debt burdens of citizens of countries. It is worth the effort to address these frictional taxes because major underground infrastructure projects to stimulate economies, promote efficiencies in the assessment, procurement, construction and operation of infrastructure and thereby deliver better economic outcomes and uplift the lives of humankind.

*“... making improvements in the quality of economic policies and institutions can help lower governments’ financing costs... Estimated cost savings are the largest for countries with weaker initial ratings and commensurately high external debt issuance costs, consistent with governance concerns contributing significantly to the large risk premia faced by weaker borrowers.”*[11]

For the purposes of this paper Frictional Tax does not include the exercise of political power to secure popular opinion where to do so raises project costs, depletes State resources or otherwise jeopardises the credit rating of a country through the political process – most typically cancelling projects, fast tracking processes or otherwise obscuring efficient project delivery to obtain a political benefit [12]. Project costs can also be raised through inefficient contracting practices (typically naïve ground risk apportionment [13] and transfer payments while the credit rating can be eroded though the higher risk of doing business locally.

The credit rating of a country directly impacts the financing costs of projects too. There is a strong and direct relationship between administrative frictional taxes, economic policies and the availability of finance, and the cost of accessing finance in local and global capital markets. There is a direct relationship between the weakest borrowers and the levels of corruption and misdirection of funds. The higher the level of the Frictional Tax the weaker and more vulnerable the people of the nation. In short Administrative Frictional Taxes are bad for humankind.

## 5. UNITED NATIONS POSITION

The United Nations Convention against Corruption (“UNCAC”) is the World’s only legally binding universal anti-corruption instrument. The Convention's far-reaching approach and the mandatory character of many of its provisions make it a unique tool for developing a comprehensive response to a global corruption problem. The majority of United Nations Member States are parties to the Convention [14].

### *As noted in the forward to the UNCAC:*

*“Corruption is an insidious plague that has a wide range of corrosive effects on societies. It undermines democracy and the rule of law, leads to violations of human rights, distorts markets, erodes the quality of life and allows organized crime, terrorism and other threats to human security to flourish. This evil phenomenon is found in all countries—big and small, rich and poor—but it is in the developing world that its effects are most destructive. Corruption hurts the poor disproportionately by diverting funds intended for development, undermining a Government’s ability to provide basic services, feeding inequality and injustice and discouraging foreign aid and investment. Corruption is a key element in economic underperformance and a major obstacle to poverty alleviation and development (Kofi A. Annan Secretary-General)”*

### *The Convention notes:*

*“...the seriousness of problems and threats posed by corruption to the stability and security of societies, undermining the institutions and values of democracy, ethical values and justice and jeopardizing sustainable development and the rule of law ... the links between corruption and other forms of crime ... that involve vast quantities of assets, which may constitute a substantial proportion of the resources of States, and that threaten the political stability and sustainable development of those States ... a transnational phenomenon that affects all societies and economies, making international cooperation to prevent and control it essential ... a comprehensive and multidisciplinary approach is required to prevent and combat corruption effectively...”*

### *And at Article 6:*

*“...the prevention and eradication of corruption is a responsibility of all States and that they must cooperate with one another, with the support and involvement of individuals and groups outside the public sector, such as civil society, non-governmental organizations and*

*community-based organizations, if their efforts in this area are to be effective ..., and to foster a culture of rejection of corruption.”*

It is the UN’s recognition of the role of a range of parties to fighting corruption which highlights the important role individuals can play fighting corruption.

***UNCACs recommends Member States enact criminal offences against any person that:***

*“...solicits or accepts the promises, offers, gives, any undue advantage (including retaining or obtaining business), acting or refusing to act in accordance with their duties.”*

These crimes can be with public officials, private organisations, public international organisations. Chapter III of Article 15 of UNCACs states that the crime extends to advantages to other persons and entities.

Because Member Nations must enact domestic legislation to make the provisions of the convention law there is always the prospect of new legislation, creating crimes for corruption which may be backdated if there is the political will to do so.

This convention is very broad and could easily be used to justify a range of new criminal offences tailored to scrutinise major subsurface projects.

As is discussed herein a change of government is often the time such new criminal law will be enacted, or their compliance pursued [15] [16] [17]. The magnitude of the Corruption Tax discussed in this paper is beyond (but includes) this narrow UN description of corruption.

Governments should recognise that fighting corruption should extend beyond enacting criminal laws to regulation of government and quasi government activities to curb the opportunities for higher costs in approvals, licencing, permits, regulation and other opportunistic activities.

## **6. DOMESTIC LEGISLATION**

An example of domestic legislation that reflects the objectives of all UN conventions is the Foreign Corrupt Practices Act of 1977 (FCPA) USA[18]. Such legislation in the United States echo’s the UN convention and makes crimes of corrupt practices in nations with domestic criminal legislation. The fight against Corruption Tax demands a 21st Century focus upon more subtle aspects of approvals, supply chains, licencing, prequalifying, utilities and other overt, essential but strictly outside the construction scope of large subsurface infrastructure. The consequence of the Corruption Taxes is still unjust enrichment of the few to the disbenefit of the many.

## **7. ENGINEERING SOCIETIES**

Increasingly the government regulation of engineers and other professionals is linked to a code of ethics which reject corruption. For example, the American Society of Civil Engineers (ASCE) Code of Ethics [19] states:

*“Canon 6. Engineers shall act in such a manner as to uphold and enhance the honor, integrity, and dignity of the engineering profession and shall act with zero tolerance for bribery, fraud, and corruption.”*

At international, national and professional levels corruption is condemned. However, neither the scale nor even the existence of Administrative Frictional Taxes is foreshadowed within these aged responses to traditional corruption. There is an opportunity to include provisions about not actively encouraging, endorsing or supporting 21<sup>st</sup> Century Corruption Taxes within the provision of these societies.

### 8. SCALE OF PROJECTS

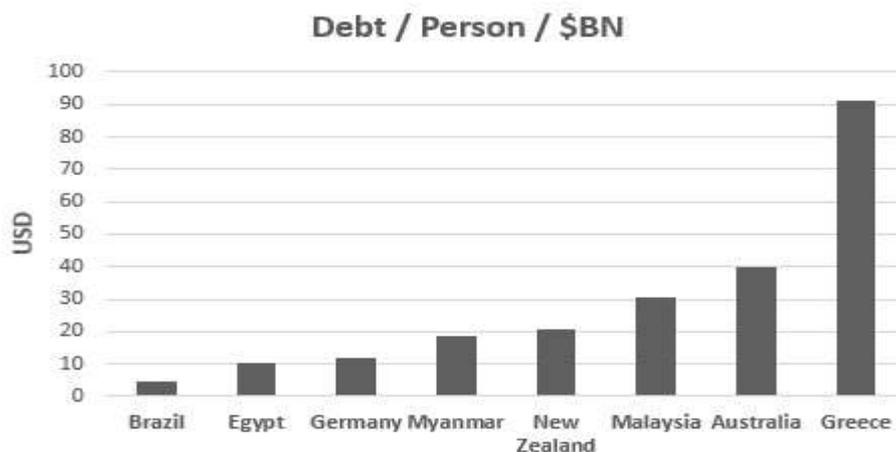
To put the scale of opportunity for Corruption Taxes into perspective, subsurface projects – no matter what country they are in, typically cost multiple billions of dollars.

**Table 1** Example of international projects:

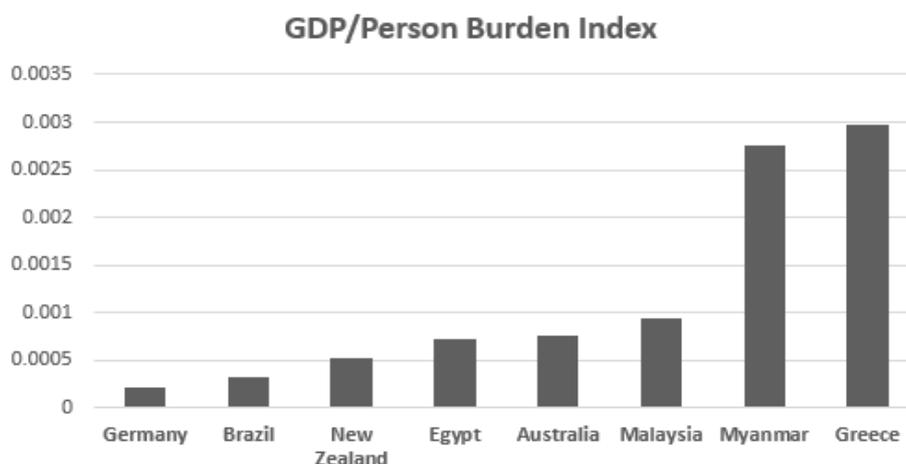
Country	Project Cost	USD \$BN
Brazil	Sau Paulo Line 5	2
New Zealand	Auckland City Rail	2
Malaysia	Kuala Lumpar LRT3	4
Egypt	Cairo Metro	6
Greece	Egnatia Odos Highway	6.80
Germany	Stuttgart 21 Rail Upgrade	7.3
Australia	Melbourne Metro	8
Myanmar	Muse Mandalay Railway	9

It does not matter what country hosts the subsurface project the costs will be in billions of dollars.

The burden of the multi-billion dollar debt to build such needed infrastructure arguably falls at the citizens of the host country either through direct debt service charges or indirectly via fares and other services charges. The burden for each citizen of an ‘illustrative’ one billion dollar debt is illustrated in the following Chart:



**Chart 1** Calculated US\$1BN / Per Capita/ Population of Country



**Chart 2** Calculated \$1Bn /population/GDP per capita

This Chart illustrates that the hypothetical billion dollar debt burden on citizens in different countries varies greatly from less than \$5 per person in Brazil to more than \$90 per person in Greece per billion dollars borrowed.

However, the scale of this burden in terms of a country's GDP must also be considered. If the individual's GDP of a country is integrated with their share of their country's debt for each billion dollars borrowed, the inequity between citizens debt is revealed.

The above graph shows that the actual burden of a one billion dollar debt on citizens in countries such as Greece and Myanmar is significantly greater than in countries like Germany and Brazil.

## 9. CREDIT RATING

In addition to the burden of debt varying between citizens of different countries, so too does the added cost of interest on the money owed.

Interest rates are a direct function of a country's credit rating.



**Figure 1** S&P Foreign Rating, March 2019

Elevated levels of interest rates collected on foreign loans contributes to the external debt crisis of developing countries. [20]

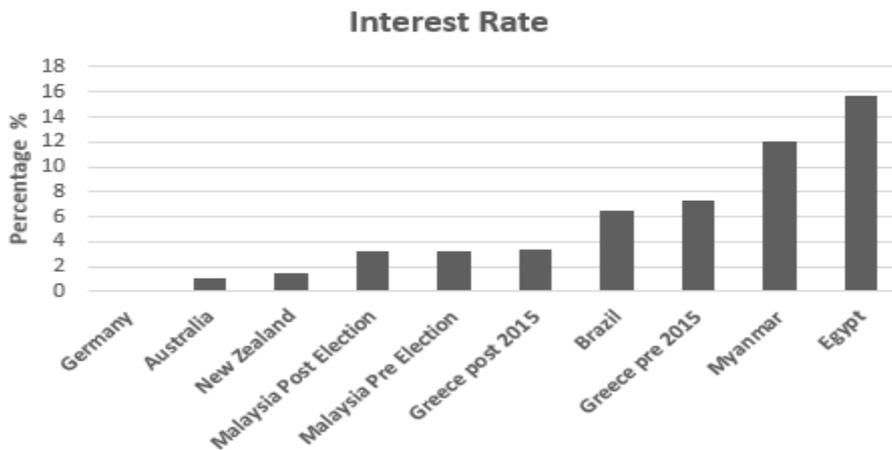
## 10. INTEREST – THE COST OF MONEY

Interest is charged on the amount of money outstanding and includes charges on the Administrative Frictional Tax. The interest rates are a function of a country's credit rating.

The large variation in interest rates charged on borrowings is reflected in the following graph which shows the spread of interest rates.

The World Bank charges interest on its loans. The interest rates vary from country to country. The interest debt is therefore a function of the economic performance of a country. The Administrative Frictional Tax burden is amplified by higher interest rates in the countries with the highest levels of frictional taxes.

There is a practice by lenders of offering low interest rate loans to poorer countries and even at times waiving debt. Such practices are discretionary and highlight the weak position of poorer countries to develop their infrastructure. Such vulnerability also reinforces the importance of minimising Administrative Frictional Taxes in these countries.



**Chart 3** Interest rates by country – World Bank Rates (snapshot 2019)

Combining all these factors, the frictional taxes can become a significant project cost and when combined with interest charges amount to a large proportion of a projects’ costs and a significant debt burden for generations of people in that country.

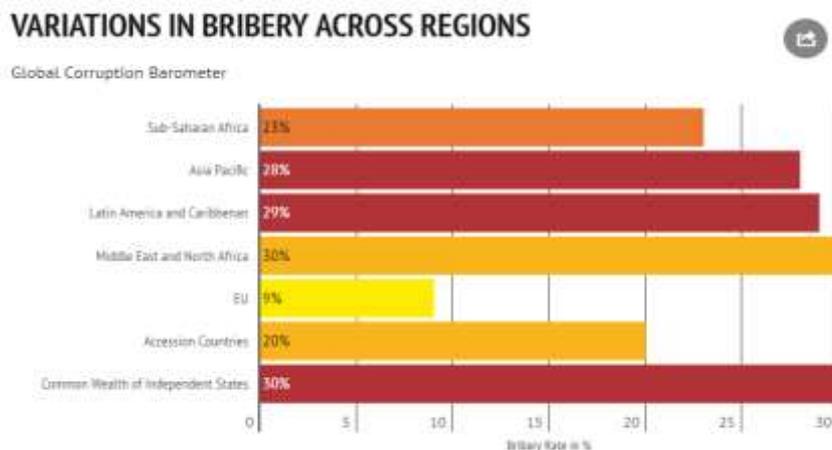
Those least able to afford the frictional taxes appear most likely to be burdened with it.

## 11. GEOGRAPHY OF ADMINISTRATIVE FRICTIONAL CORRUPTION

For the purposes of this paper the scale of likely Administrative Frictional Tax ‘surcharge’ is inferred from data on perceived international bribery rates. In this paper, for the purposes of the discussion, Frictional Tax is directly scaled using the Bribery Index and calculations of impact of Frictional Tax directly made between 10-30% of project cost. It is acknowledged that the actual Frictional Tax rate may vary from this assumption, but the scale of the Frictional Tax is considered likely correct.

From the below charts it can be seen that bribery touches all countries and its rate varies from around 10%, in the EU to around 3 or 4 times the EU rate to 30% in the Middle East and North Africa. For the purposes of this paper it is assumed this translates to a similar overall rate of Corruption Tax. In this paper this additional project expense is called the ‘Frictional Tax’. The magnitude of the ‘tax’ may be debated – but its existence and the variability between nations and projects is indisputable.

A published indicative rate of bribes (by regions) is summarised in the following chart.



**Chart 4** Variation in Bribery across Regions [21]

## 12. THE COST OF SUBSURFACE INFRASTRUCTURE FRICTIONAL TAX

The likely scale of the Frictional Tax means that for every dollar borrowed it is arguable that it could be somewhere between 10% to 50% (10 cents to 50 cents in every dollar spent) is not paid for the actual infrastructure constructed. Generally, the higher the rate of Frictional Tax the lower the credit rating of the country and the higher the rate of interest charge on the loans. There is a generally an inverse relationship between the GDP per head of population and the interest rate charged – that is, the poorer the people the higher the rate of interest charged.

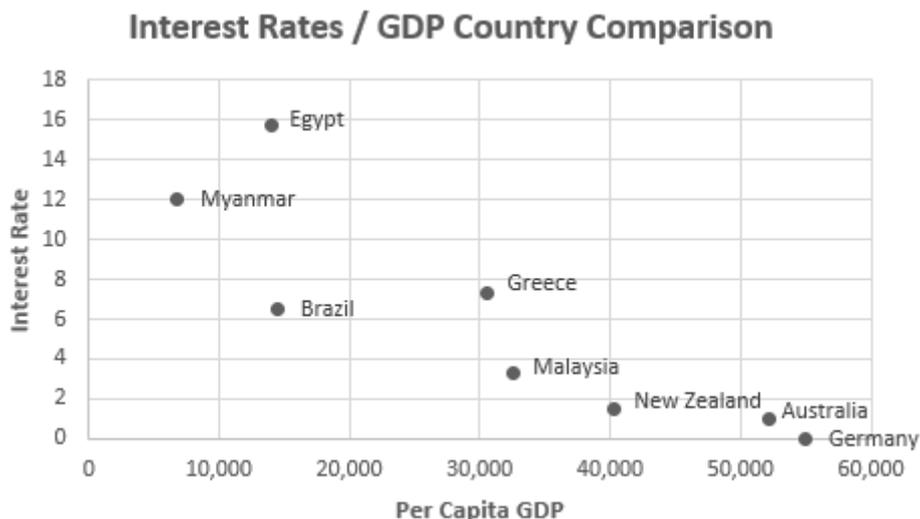


Chart 5 Interest Rates / GDP Country Comparison

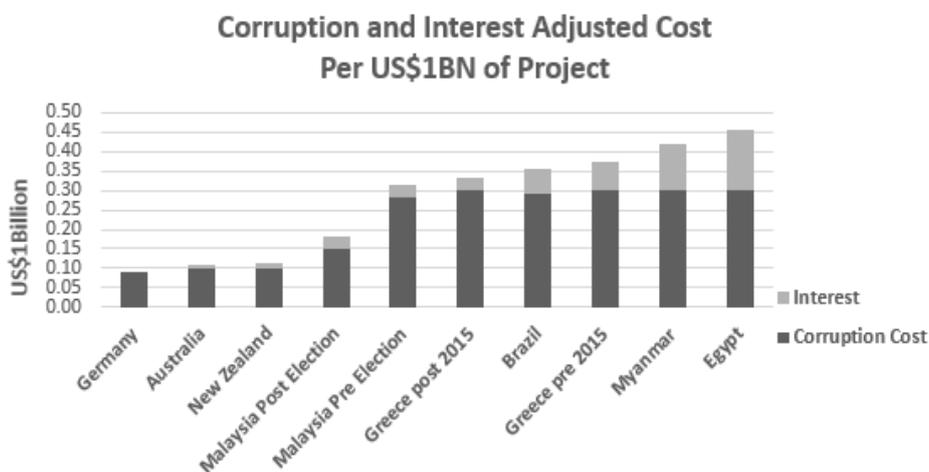


Chart 6 Speculated interest adjusted corruption cost

The cumulative effect of these factors is that the countries in most need of improvement to infrastructure are least able to afford it because of the combination of low income, poor credit rating, high interest rates and higher likely levels of Frictional Tax. The corollary is also true, richer nations that currently enjoy excellent credit rating, high income and lower Frictional Tax, stand to lose the most if corrupt practices emerge, credit ratings drop, and interest rates rise.

### 13. PRACTICAL MEASURES AGAINST FRICTIONAL TAXES

Frictional Taxes are based on a continuum of relationships, interactions and transfers. While there is no single ‘cure’ for this Tax, good governance, in the national interest, transparency, the rule of law, the voice of the individuals, the conduct of corporations, the conduct of banks and financial system, social media and international pressure are all examples measures which can influence the levels of Frictional Taxes.

In this context let us examine a recent example where government intervention significantly reduced the cost of a project.

#### 13.1. Malaysia

An election in 2018 resulted in the first change of political regime in modern Malaysia’s history since its 1957 independence. The Pakatan Harpan coalition was elected on an anti-corruption platform. Once elected the new government’s focus was broadly described as to lift Malaysia’s large proportion of citizens living in poverty above the poverty line [22].

The new government scrapped and/or suspended many projects.

*“[The new Government] cancelled a 40-kilometer (25-mile), \$11.25 billion driverless subway line in Kuala Lumpur. He suspended work on the \$17 billion, 350-kilometer (217-mile) Kuala Lumpur-Singapore high-speed line. In early July, his administration announced the suspension of the projected \$14 billion East Coast Rail Link (ECRL), a 688-kilometer (428-mile) fast electric rail line from Kuala Lumpur’s port on the Strait of Malacca, across the Malaysian peninsula to northeastern port cities along the South China Sea.*

*Malaysia also is pursuing a criminal investigation of fraud and malfeasance against a top transit official prompted by the transfer of valuable government-owned land close to a transit station at no cost to the developers.” [23]*

The new government was mindful of the impact such cancellations and suspensions would have on projects already under construction and chose not to disturb them, thereby mitigating the risks of a downgrading of his country’s credit rating.

*“To avoid even greater shocks to Malaysia’s economy and its international reputation, Mahathir has taken no action to impede ongoing construction of two new metro lines in Kuala Lumpur or a new 3.4-kilometer (2.1-mile), \$1.34 billion electric commuter line from southern Malaysia to Singapore.”*

The KLR3 project had an original contracted price of RM31.6B (US\$7.7B) and after the Prime Minister Mahathir assigned the Ministry of Finance to review the LRT3 budget and contracts the price was reduced to RM16.6 (US\$4B) (a saving of nearly 50%). The government negotiated new contracts and marginally reduced the scope of the project. The Finance Minister, Lim Guan Eng, was reported as saying:

*“Why did they allow the project delivery partner to charge such high costs? If there was no change in government, this money would be paid by our children. They were stealing our children’s future.”*

This is an example how the government exercise of power, can change the focus on Frictional Taxes, and thereby minimise unnecessary intergenerational debt, and in time improve a countries credit rating and interest rates. The projects are undoubtedly needed and entirely appropriate – and a focus on corruption and Frictional Taxes resulted in a substantial reduction in project cost for the benefit of that Country.

Typically, the landscape for the construction of a project is mostly controlled by the Government. Construction companies must work within the administrative and regulatory ecosystem controlled by the government. This creates both a burden and an opportunity upon

governments to govern for the good of their people. Identification and reduction of Administrative Frictional Taxes is part of good governance.

## **14. MINIMISING FRICTIONAL TAXES - REFORM**

Governments are uniquely placed to implement different measures to manage administrative frictional taxes.

The following measures are recommended for consideration:

### **14.1. Good Governance and Transparency**

Governments can mandate governance and transparency requirements for all participants in major subsurface infrastructure. The exact provisions can be varied depending upon the local environment. However, it is the government that can set the rules for engagement by which major subsurface infrastructure is delivered.

### **14.2. Finance and Insurance**

Governments can set the rules for both private and public sector debt. Likewise, risk mitigation through insurance can be regulated by the government. Such controls impact the nature and extent of intergenerational national debt.

### **14.3. Procurement**

The framework for lawful procurement is fundamental regulates the successful parties to major underground infrastructure projects. Robust procurement is a fundamental prerequisite to efficient and effective infrastructure delivery.

### **14.4. Licencing and Approvals**

Licencing and approvals must be merit based and not a veil for extortion of unjust enrichment of administrators and allied professionals.

### **14.5. Labour**

Protection of income and safety of workers is a fundamental duty of government. This duty must not be misused as a mechanism to unjustly enrich individuals or organisations through devious labour market manipulation.

### **14.6. Audit, Verification, Complaint and Adjudication**

Ultimately projects need a mechanism to monitor, bring to account and enforce government regulation of project activities. An effective regulatory body is essential to holding administrative frictional taxes to a minimum.

## **15. CONCLUSIONS**

Administrative Frictional Taxes burden projects in all countries. The rate of Administrative Frictional Taxes and the ability of a country's citizens to bear the costs of frictional taxes vary largely between countries. A failure to robustly exercise executive power to actively manage these taxes – to minimise them from the outset and regulate them as they emerge - is a costly abrogation of the unique power of the State to maximise value and benefits for its citizens of major projects.

Understanding that the countries in most need of underground infrastructure typically have the poorest credit ratings, highest interest rates, lowest incomes reinforces the importance of resisting corrupt practices in the worlds' poorest countries – even when such

practices may locally be considered the ‘norm’. In more developed countries the fragility of good credit ratings also deserves special attention as change to credit ratings can substantially alter a nations interest debt and ability to service the loan.

As leaders in the global subsurface construction industry we have a professional, ethical and moral opportunity to promote practices which deliver infrastructure for a fair price. Promoting practices which oppose Administrative Frictional Taxes including corruption is good for our industry and ultimately delivers the best results for humanity.

Governments are uniquely placed to regulate and enforce measures to minimise frictional taxes including corruption. Such measures protect the value of expensive underground infrastructure and reduce unfair intergenerational debt.

In order to minimise the burden of Administrative Frictional Taxes enactment of enabling laws and regulation to create and enable a transparent and accountable environment for procurement, permits and approvals, create public disclosure of private interests held by decision makers, set minimum labour requirements, establish base contractual and financial requirements, and generally implement strong governance and probity requirements, will benefit project costs and the community of future tax burden.

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## APPENDIX A – DATA SUMMARY FOR DEBT BURDEN ANALYSIS

Country	GDP (PPP) Per Capita USD	Population 2019	Debt/ person/ billion \$	Index /GDP	Personal GDP adjusted Capita burden to fund \$1BN	Project Cost - USD	Estimated Corruption Surcharge	Credit Rating S&P	Global Interest Rates
Myanmar	6,797	54M	18.52	0.0027525	147,123.73	Muse-Mandalay Railway \$9B	30%	Not rated	12
Australia	52,191	25M	40.00	0.0007664	19,160.40	Melbourne Metro \$8B	10%	AAA	1.0
Egypt	14,048	99M	10.10	0.0007189	71,184.51	Cairo Metro \$6B	30%	B	15.75
Malaysia	32,501	32.5M	30.77	0.0009467	30,768.28	Kuala Lumpur Light Rail Transit 3 pre 2018 \$7.7B	28%	A-	3.25
						KLR post election 2018 \$4B (-48%)	15% <sup>1</sup>		
New Zealand	40,266	4.8M	20.83	0.0005173	24,834.85	Auckland City Rail \$2B	10%	AA	1.5
Greece	30,522	11M	90.91	0.0029785	32,763.25	Egnatia Odos Highway \$6.8B	30%	B+	7.27 pre 2015 3.37 post 2015
Germany	54,983	83.5M	11.98	0.0002179	18,187.44	Stuttgart 21 rail upgrade \$7.3B	9%	AAA	0.0
Brazil	14,500	212.5M	4.71	0.0003249	68,965.52	Sau Paulo Line 5 Metro \$2B	29%	BB-	6.5

Sources: GDP (PPP) United Nations; S&P 2018/19; Global Rate of the Central Banks; World Bank Policies and Procedures 2018, Article III, Loan Terms, Section 3.02. Interest (General Conditions) [www.worldbank.org](http://www.worldbank.org)