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ABSTRACT

Black Man's Burden: Measured Philanthropy in the British Empire, 1880-1913*

Ferguson and Schularick (2006) recently provided a measure of the effect of Empire subjection on borrowing countries' interest rates. They find this effect to be large and significant, ranging between 80 to 180 basis points. We argue that their methodology is inadequate and that their estimates are biased. The reason is that Empire subjection did not affect borrowing conditions at the margin, as they assume, but structurally. We also develop a new approach of the incidence of colonial rule on market access. It suggests that the benefits of Empire were unevenly distributed. It shows that the main incidence of colonial rule was to create financial incentives to adopt development policies that encouraged government spending.

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"If we leave Iraq there will be chaos.
Chaos is worse, right?"
(Anti-Iraq war magnet)

In 1908, Lord Cromer, a British administrator for Egypt, published a noted essay in what would be called today development economics.[1] The article praised a philanthropic colonial rule for inspiring decisions that were taken "mainly" with reference to what was, by the "light of Western knowledge and experience tempered by local considerations", "conscientiously" thought to be best for what he called "subject races".

While his good faith is not questioned, economists will find it puzzling that the self-interest of the metropolis could be trusted for being compatible with that of the subject. A possible suggestion had been made a few years earlier by Cecil Rhodes. He said, half-in-joke, that imperialism was "philanthropy plus 5 per cent". The five percent was the return for British investors. The source of philanthropy is less clear. It may have been the benefit that colonial institutions provided subjects with, thanks to interest rates lower than they would have faced, had these institutions not existed.

How much philanthropy was involved? To answer, one must form an idea of what would have happened, had Empire countries been sovereign ones. But as the opening quote suggests in a humorous way, this is a difficult counterfactual. We cannot content ourselves with noting the simple stylized fact that average interest rates on bonds were *in general* lower for colonies than for sovereign nations. More than twenty years ago, this stylized fact was old news when Lance Davis and Robert Huttenback's published their path-breaking study of the political economy of the British Empire.[2]

Davis and Huttenback provided a plausible counterfactual scenario of the effects of sovereignty. It rested on identifying countries by level of development and assuming that the interest rate sovereign countries were charged was a function of their degree of their development. A poor British colony, if freed, would have become a poor sovereign. A rich British colony, if freed, would have become a rich sovereign. Poor sovereigns faced on average higher interest rates than rich ones. Colonies all faced similar borrowing terms. Davis and Huttenback concluded that the interest rate reduction from Empire subjection was biggest for the poorest.

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[1] . Evelyn Baring [Lord Cromer], "Government of subject races".
[2] . "That the Empire received favorable treatment in the capital market has been well recognized". Davis and Huttenback, *Mammon*, p. 171.

Recently, Niall Ferguson and Moritz Schularick have returned to the matter.[3] They have used a model of the determinants of "country risk" – a concept usually associated with ratings – which they take as synonymous to "default risk".[4] They have considered a sample of both sovereign countries and colonies and measured an Empire effect by including a dummy variable. They claim this method does measure properly the interest reduction associated with being a subject of the British Empire, compared with being a sovereign. They report a statistically significant rebate ranging between 80 and 180 basis points. They consider this a large figure. They claim that colonization was a price worth paying in order to secure development over the long run, seeing a "trade-off for the poor countries between political sovereignty and credit worthiness". They argue that "the imperial system was conducive to global economic growth". Like Lord Cromer, they find merits in the "importation or imposition of less dysfunctional economic institutions" from the metropolis.[5]

The present article provides analytical and empirical material that bear upon this issue. We are critical of Ferguson and Schularick, and show that their model is mis-specified. Our departing point is the uncontroversial fact that Empire countries were not sovereigns. They were sub-sovereign entities that may be likened to provinces or cities in a unitary State. Therefore, one cannot model the effects of Empire as a marginal rebate, captured by a dummy variable in a regression that pools sovereign and sub-sovereign entities. The incidence of Empire is structural. We show that Ferguson and Schularick's model specification introduces biases in the estimation of the effects of Empire subjection and of the incidence of the other factors that are relevant in the determination of sovereign countries' bond spreads.

On the positive front, this leads us to provide a new discussion of how a more proper counterfactual of the incidence of Empire ought to be organized. One contribution of our study is that we bridge macroeconomic research on bond spreads with recent work on the microeconomics of colonial institutions by Stanley Engerman and Ken Sokoloff, Daron Acemoglu, Simon Johnson and James Robinson.[6] In particular, we show that alternative imperial systems should be considered as so many regimes that differed profoundly among

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[3] . Ferguson and Schularick, "Empire effect".
[4] . Technically, "Country risk" is the likelihood that changes in the business environment adversely affects operating profits or the value of assets in a specific country. Strictly speaking therefore, the expression "country risk" should not be used as an equivalent of "default risk", let alone "bond spreads". For some reason, the expression is nonetheless widespread in the literature (see e.g. Sussman and Yafeh, "Meiji").
[5] . Ferguson and Schularick, "Empire effect", p. 308.
[6] . Engerman and Sokoloff, "Paths of development", Acemoglu et al., "Colonial origins", "Reversal of Fortune", "Franchise".

themselves and with respect to the institutions of sovereignty in the incentives they created for designing specific growth strategies.

The next stage of the analysis is akin to the Lucas critique: just as market prices react to government policies, governments react to market pricing. We argue that the institutions of the so-called self-governing colonies (Australia, Canada, New Zealand) led to market expectations that encouraged a heavier government involvement in the process of economic growth than was the case under sovereignty. This finding is consistent with the "welfare state puzzle" identified by Peter Lindert.[7] By contrast, the institutional set-up of so-called dependent colonies (Ceylon, Jamaica, etc.) and India encouraged lower levels of aggregate investment. We see this as providing a macroeconomic mapping of the microeconomic flaws that earlier research has associated with so-called "extractive" colonial institutions.

The remainder of the paper is organized as follows; Section I reviews modern research on the connection between colonial institutions and economic development. Section II surveys econometric work on the historical determinants of borrowing spreads. Section III provides benchmark regressions for these methodologies using two alternative datasets. Section IV tests and rejects Ferguson and Schularick's view that similar variables were at work in the determination of sovereign and colonial spreads. Section V follows the "grass-root" approach advocated by Marc Flandreau and Frédéric Zumer to derive and test an alternative model of colonial spreads determination.[8] Section VI, finally, provides new analytical insights for measuring the incidence of alternative colonial rules. The "benefits" of empire subjection depended critically on the type of colony one is looking at. By and large, the evidence suggests that white populated "self-governing" colonies derived some gains, while "dependent", colonies where non-whites predominated, did not. The Empire, we conclude, was not too good a thing for the vast majority of its subjects – it burdened those who did not have the right skin color.

Section I. Subjection and Development

We begin with a discussion of the relations between colonial institutions and development. These relations, while providing a somewhat distant background to the specific topic at hand, are nonetheless important and even critical, when it comes to the elaboration of reasonable counterfactuals for what countries would have done, had they been freed.

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[7] . Lindert, *Growing public*, claims that government spending may not be always associated with lower growth performances and finds that countries in the self-governing Empire were pioneers in the development of welfare state institutions.

[8] . Flandreau and Zumer, *Making*.

Previous research on colonies and development emphasized the existence of cross-country variation. Following Richard Easterlin's discussion a quarter of a century ago, scholars recognize that human capital accumulation, inequality and democracy account for most of individual countries' development path and that these were affected by alternative colonial institutions. It is also admitted that cross-country variation is not only about differences in colonizers. As Sokoloff and Engerman argue, "having been part of the British Empire was far from a guarantee of economic growth".[9]

Davis and Huttenback remark that poor British colonies did not receive much capital, while rich ones did. They argue that poor colonies lost from being subjects but rich ones benefited: "The technology of the imperial machine […] involved some transfer of resources to the colonies; however, it is not obvious that either India or the dependent colonies [Ceylon, Jamaica, etc.] would have chosen to accept the imperial subsidy had they be given the opportunity to object… The colonies with responsible government [Canada, Australia…] were clear winners; India and the dependent Empire, probably, were losers.[10]

A paper by Clemens and Williamson argues that Empire subjection did not increase the amount of capital that countries received from London. They suggest that human capital accumulation (schooling and literacy) is more strongly correlated with capital imports from London than being a subject nation. There were indeed considerable differences within colonies. Schooling was higher in New Zealand than in England and the gap was rising. It stagnated in India or Ceylon. Growth followed suit.

Engerman, Sokoloff and co-authors emphasize the importance of inequality in preventing the accumulation of human capital.[11] Control over education is a barrier to entry that the haves can use against the have nots. Elites have an interest to under-invest in schooling and primary education. Therefore inequality and the institutions it breeds are responsible for the observed shortcomings in some colonies' education provision. The different record between dependent colonies and those with responsible government suggests that colonial governance institutions were, in one way or another, part of the machinery that caused such patterns to emerge and persist. It is perhaps hard to think of a democracy that encourages ignorance.

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[9] . Engerman and Sokoloff, "Paths of development" p. 219.

[10] . From abridged edition. See also Davis and Huttenback, *Mammon*, p. 191: "The value of those benefits was high in the colonies of white settlement. [...] For the remainder of the Empire, the returns are less obvious. [...] For India and the dependant colonies one cannot rule out the conclusion that everyone (Briton and Indian) lost – a true Pareto *pessimum*"

[11] . Engerman and Sokoloff "Factor endowments", "Paths of Growth", "Suffrage institutions". See also Engerman, Mariscal and Sokoloff "Persistence of inequality", Engerman, Haber and Sokoloff, "Inequality, Institutions".

Variation within colonial experiences is also a central theme of a series of articles by Acemoglu, Johnson and Robinson.[12] Their work is a theoretical elaboration of the ideas in Engerman and Sokoloff, beginning with the observation that many areas that were rich in 1500 became poor hereafter. They explain this "reversal of fortune" by different institutional patterns within alternative colonies. "Extractive" institutions, on the one hand, were set up to exploit local resources through native or imported slave labor, as was the case in the mines of Peru or in the Caribbean. "Good" institutions on the other hand, were set up where Europeans settled to replicate "and often improve" the European norm of institutions protecting private property. Among the primary examples of this mode of colonization, they single out Australia, Canada, New Zealand, and the United States. They argue that settlers in these societies managed to place significant constraints on elites and politicians.

This sealed the fate of subsequent development. Extractive institutions colonies were doomed. They produced powerful elites who were actively seeking to secure rents. When independence was achieved, elites preserved the old order. By contrast, colonies with good institutions could prosper and grow. They now feature among the richest areas in the world.

One intriguing question is that of determining why where extractive or good institutions introduced. Since extractive institutions under-performed, they should not have been introduced in the first place or removed after a while. Acemoglu et al. argue that European colonists "chose" good institutions when it was in their interest to do so, when they would be the ones living under the umbrella of these institutions. They also claim that extractive institutions were adopted where Europeans did not settle and cared little about aggregate output or the welfare of the indigenous population.

This brief discussion reveals striking parallels between modern views on colonial lessons for economic developments and the earlier account by Davis and Huttenback of financial transfers within the British Empire. For instance, Davis and Huttenback distinction between dependent and self-governing colonies (the former black, the latter white) does match the emphasis on extractive vs. good institutions colonies.

At the same time, this parallel suggests that the debate about the incidence of colonial institutions on subsequent development could be drawn on a different field. Acemoglu et al. equate colonial institutions with European goals and incentives and thus implicitly assume the existence of a colonial social planner. But historical evidence demonstrates that colonies and

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[12] . "Colonial origins", "Reversal of Fortune", "Franchise". Their work was originally advertised as a challenge to the view that economic development is determined by geographic factors. On geographical determinism, see McCulloch, *Dictionary*, Easterly and Levine, "Tropics, germs and crops", Sachs, "Tropical underdevelopment".

their metropolis were not exactly a single entity, as the American Revolution demonstrated. In other words, we suggest that the political economy of colonial institutions is still in need of an elaboration. Institutions are not only the result of initial opportunism, later supported by lock-in effects. They can be seen as the outcome of a bargain between the mother country and its political satellite. The costs and benefits of secession, the political and geo-strategic motives of the center, and the degree of coercion available to it, are critical ingredients shaping the outlook of colonial institutions.[13]

Reaching a stage where we can meaningfully discuss these matters is still a long shot. This paper seeks to provide some insights, dealing narrowly with the capital market and hopefully laying the ground for future research.

Section II. The Spread of Empire

In what follows, we survey the literature that has been concerned with exploring the determinants of government bond prices and measuring the incidence of Empire subjection on borrowing costs. One difficulty with this literature however, is that it has displayed considerable variance regarding both the data used and the precise specification. In what follows, we level the playing field by mapping the various approaches into a common thread. This is done for heuristic purposes and without loss of generality. As the reader can see for herself, the points we emphasize are robust to changes in specifications.

A) The Davis and Huttenback Approach

Davis and Huttenback analyze the financial transfers that occurred both across and within countries as a result of the British colonial set up. In Chapter 6 ("British subsidies to the Empire"), they provide a regression analysis of the incidence of colonial status on borrowing costs. They seek to quantify the interest subsidy received by alternative groups of colonies.

For this purpose, they regress bond spreads on a set of regime dummies.[14] They distinguish two main groups of colonies according to their governance structure: first, responsible self-governing dominions (such as Canadian and Australasian colonies), and second India and the dependent colonies (such as Ceylon, Jamaica), run from London. The size and importance of

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[13] . See Flandreau, "Logic of Compromise", for an elaboration of the political economy of Empire, in a different historical context.

[14] . See Davis and Huttenback, *Mammon*, p. 172-3. In particular, they work with bond yields in level and control for changes in the yield in risk free assets by including the yield on British consols on issue date as a right hand side variable. The coefficient they obtain for British consols is close to one but not exactly unity, and as a result it is difficult to make comparisons with pure spread regressions. Davis and Huttenback also include issue specific controls (size of the issue, maturity and a time trend). Note that maturity is an indicator of perceived default risk, because risky governments may be rationed on the longer end of the market.

India motivates it being given a special status within the dependent group. They also identify two groups of sovereign countries according to degrees of development.

Calling s_{it} the spread at issue,[15] this amounts to writing:

$$s_{it} = \alpha_0 + \alpha_1 \cdot \theta_{underdev} + \alpha_2 \cdot \theta_{ind} + \alpha_3 \cdot \theta_{dep} + \alpha_4 \cdot \theta_{slf} + \varepsilon_{it} \quad (1)$$

where $\theta_{underdev}$ is a dummy variable for underdeveloped sovereign countries, θ_{ind} is a dummy variable for India, θ_{dep} is a dummy variable for dependent colonies and θ_{slf} is a dummy variable for the "self-governing" ones. By definition, the estimated parameter $\hat{\alpha}_0$ (or $\bar{s}_0$) is the *average interest spread* for the non-Empire developed countries (or $\bar{s}_0$), $\hat{\alpha}_0 + \hat{\alpha}_1$ (or $\bar{s}_1$), is the average interest spread for non-Empire underdeveloped countries, and $\hat{\alpha}_0 + \hat{\alpha}_2$, $\hat{\alpha}_0 + \hat{\alpha}_3$ and $\hat{\alpha}_0 + \hat{\alpha}_4$ are the *average interest spreads* for the different groups of colonies (resp. India, dependent, and self-governing, or $\bar{s}_2$, $\bar{s}_3$ and $\bar{s}_4$).

Davis and Huttenback find the average premium paid by India over loans to British authorities to be "less than 1 percent". They also report "about 1 percent" for dependent and self-governing colonies, "in excess of 2 percent" for foreign sovereign developed countries, and "more than 4 percent" for sovereign underdeveloped countries. To compute the counterfactual benefit from Empire subjection they suggest that a change of status (independence) is tantamount to switching from one group to the other one, bearing in mind that there are developed and non-developed countries.[16] The benefit of Empire they estimate is thus the "spread of spreads", or the difference between group averages. It is of about 3 percent for India and dependent colonies, and 1 percent for self-governing ones.

From the strict point of view of interest costs, poor dependent colonies gained more from subjection than rich self-governing ones. However, Davis and Huttenback argue that the actual subsidy must be computed by multiplying the previous interest reduction by the amount of capital received. This measure is essentially a proxy for consumer surplus. It does reverse the ranking of beneficiaries. Self-governing received much capital and dependent colonies, little. This explains Davis and Huttenback's critical assessment of the effects of

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[15] . Computed as the difference between r_{it} the yield-at-issue on the bonds and r_{ukt} the secondary market yield on British bonds at the issue date

[16] "It appears, therefore, that if India and the dependent colonies are comparable to the underdeveloped nations included in the sample, and if the colonies with responsible government can be compared with the developed countries, membership in the Empire seems to have meant that on average loans were about 3.5 percent cheaper for India and the dependent colonies and just less 1 percent less expensive for colonies with responsible government" Davis and Huttenback, *Mammon*, p. 145 from abridged edition.

Empire subjection, which they summarize as follows: "A strange kind of philanthropy – socialism for the rich, capitalism for the poor".[17]

Davis and Huttenback's counterfactual is driven by the average behavior of non-Empire countries – developed or under-developed. But suppose we ask what would happen if, say, an under-developed Empire country secures independence, and suppose moreover that at the precise date when this is happening, certain countries in the control group of sovereign under-developed nations default, deteriorating this group's average borrowing spreads. We would conclude that the country seeking independence faces deteriorated prospects and consequently, we would measure a higher Empire effect even if the prospective sovereign's fundamentals are completely unrelated to those of the defaulting sovereign.

To the extent that borrowing costs, instead of being determined by "group membership", are affected by a country's actual behavior and fundamentals, there is no reason to assume that a newly independent country would subsequently behave like the average of the groups it joins.[18] We conclude from this that a sounder counterfactual should be one, which provides a better prediction of a country's behavior, once independent. This suggests turning to the determinants of sovereign countries' borrowing spreads.

B) Sovereigns as Counterfactuals

<u>1) Empirical Research on Bond Spreads</u>

Empirical research on the determinants of sovereign bond spreads goes back to a paper by Mike Bordo and Hugh Rockoff where these authors sought to prove that spreads were determined by gold standard adherence. They motivated their framework in reference to the Capital Asset Pricing Model, a classic instrument for portfolio choice.[19] Without loss of generality, the analysis can be conducted in the simpler context of a model of default probability.[20]

The study by Marc Flandreau, Jacques Le Cacheux and Frédéric Zumer showed that other macroeconomic fundamentals made a critical contribution to reputation. They use a wider array of estimation techniques,[21] and estimate the following equations (s_{it} is secondary

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[17] . Davis and Huttenback, from abridged edition of *Mammon*.

[18] . Belgium and Finland, two former protectorates that secured independence in the 19th century, almost immediately featured among the best signatures in Europe. Their own characteristics must have played a role in this, and we might not be able to learn a lot by looking at what was happening in other nations.

[19] . Bordo and Rockoff, "Good housekeeping". For other research using the CAPM motivation see Obstfeld and Taylor "Sovereign Risk", Mauro, Sussman and Yafeh, "Emerging Markets".

[20] . Flandreau, Le Cacheux and Zumer, "Stability".

[21] . Flandreau, Le Cacheux, and Zumer, "Stability".

market bond spread, x_{it} is a vector of exogenous country specific "fundamentals", β a vector of parameters, and a variable with a bar refers to time average):

$$s_{it} = x_{it} \cdot \beta + \varphi_i + \varepsilon_{it} \qquad (2)$$

$$s_{it} = x_{it} \cdot \beta + \varepsilon_{it} \qquad (2')$$

$$\bar{s}_i = \bar{x}_i \cdot \beta + \varepsilon_i \qquad (2'')$$

Specification (2) is the "fixed effects" regression (φ_i is country i fixed effect), specification (2') is the "pooling" regression and specification (2'') is the "between" regression. Running the previous equations on a sample comprising sovereign countries only, Flandreau et al. report evidence of a large and significant effect of debt burdens on borrowing terms.

A subsequent monograph by Flandreau and Zumer extends these insights by testing hypotheses on investors' perceptions.[22] They articulate what they call a "grass-roots" approach. Using contemporary archive and secondary sources, they infer variables that international investors might have been monitoring. They include these variables in equation (2) and test whether they show up with large and significant effects. Important variables to explain bond spreads include the debt burden, previous default, exchange rate mismatch, political regime (extension of the franchise) and political unrest. Other factors have dubious effects. Flandreau and Zumer find no evidence that the gold standard lowered bond spreads. This is consistent with the material they found in contemporary analysts' notes. They conclude that "investors could see through the veil of monetary regimes".[23]

2) Enter the colonies

Other authors have extended specification (2) and (2') to study the pricing of colonies. Maurice Obstfeld and Alan Taylor and later Ferguson and Schularick adapted the methodology above to test for the existence of an Empire effect.[24] One way to do this is to introduce θ_{col}, a dummy variable capturing the marginal effect of colonial subjection.

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[22] . They draw a comparison between 19th century orthodoxy and modern counterparts, such as the "Washington consensus". For a detailed discussion of macroeconomic orthodoxy in the 19th century, see also Flandreau "Crises and punishment". Ferguson and Schularick have later drawn the very same parallel, using a similar language and writing about a "London consensus" (Ferguson and Schularick, "Empire effect", p. 293).

[23] . Flandreau and Zumer, *Making*, p. 44.

[24] . Obstfeld and Taylor, "Sovereign risk"; Ferguson and Schularick, "Empire effect". Obstfeld and Taylor use the "CAPM-inspired" specification, while Ferguson and Schularick consider both the default risk model and the CAPM version.

This dummy cannot be included straightforwardly in the fixed effect regression (2) because it is a linear combination of individual fixed effects.[25] A possible solution is to consider a two-stage fixed effects regression. In the first stage, equation (2) is estimated. The Empire effect is retrieved in the second stage by regressing the estimated fixed effects from the first stage on a constant and a colonial dummy (η_i is the random component of individual fixed effects):

$$\begin{cases} s_{it} = x_{it} \cdot \beta + \varphi_i + \varepsilon_{it} \\ \hat{\phi}_i = \theta + \gamma \cdot \theta_{col} + \eta_i \end{cases} \qquad (3)$$

The Empire effect is assessed by looking at whether γ is negative, large, and significant. Essentially, this model asks whether fixed effects for the subgroup of Empire countries are as a whole significantly lower than the sample mean fixed effect.

Alternatively, one can work with the "pooling" specification (2') in which a colonial dummy can be added:

$$s_{it} = x_{it} \cdot \beta + \alpha \cdot \theta_{col} + \varepsilon_{it} \qquad (4)$$

Obstfeld and Taylor emphasize results with (3) while Ferguson and Schularick work with (3), (4), and a number of other variants. They reach different conclusions. According to Obstfeld and Taylor, the colonial dummy is not significant and has often the wrong sign. They conclude that "membership in the British Empire was neither a necessary nor sufficient condition for preferential access to London's capital market before 1914."[26] By contrast, Ferguson and Schularick report an effect of Empire subjection which ranges between 80 and 180 basis points and conclude on the benefits of Empire subjection.

These differences can come from three possible sources at least. First, the two datasets are not identical. Obstfeld and Taylor's sample has 22 sovereign countries and 5 subjects of the British Empire over the period 1870-1914. The sample in Ferguson and Schularick has 34 sovereign countries and 23 subjects for the period 1880-1913.[27] A second source of discrepancy is the precise estimation technique. Ferguson and Schularick include time effects

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[25] . There was very little variation in colonial status during the period under study, and as a result the marginal effect of losing or gaining independence cannot be identified in a meaningful way. Possibilities include Egypt, Orange Free State and Transvaal. However, basing the entire assessment of the Empire effect on such limited evidence seems preposterous.

[26] . Obstfeld and Taylor, "Sovereign risk" p. 265.

[27] The authors refer to their dataset as "the largest possible sovereign bond database for the period 1880-1913" (p. 289).

in all regressions, while Obstfeld and Taylor don't.[28] Finally the list of explanatory variables is different. Any combination of the previous factors could account for the results.

3. Ferguson and Schularick vs. Flandreau and Zumer

We now focus on the precise specification in Ferguson and Schularick and discuss it in relation to that in Flandreau and Zumer.[29] The reason is that, instead of the factors used by Obstfeld and Taylor, Ferguson and Schularick have relied on explanatory variables, which they say are "comparable, though not identical, to the variables used by Flandreau and Zumer".[30] This is motivated by an emphasis on contemporary opinions which is found in Flandreau-Zumer.

Ferguson and Schularick's list of explanatory variables can be mapped almost perfectly into the list Flandreau and Zumer have used for sovereign countries. Like Flandreau and Zumer, Ferguson and Schularick consider the debt burden, default, previous default (memory), trade openness, political upheavals and adherence to gold.[31]

There is nonetheless a number of differences in their precise specification. We have trouble understanding the reasons for this as they are not clearly stated. Sometimes they are not discussed at all. This is the case for the memory of default variable which Flandreau and Zumer following Barry Eichengreen and Richard Portes measure as an exponentially decaying effect.[32] Ferguson and Schularick measure it as a previous default dummy variable. This is the case for the trade openness variable, which they compute as the ratio of exports to population, when Flandreau and Zumer measure openness relative to Britain.[33]

When a discussion of the variables in Flandreau and Zumer is provided, we find it unpersuasive. For instance, Ferguson and Schularick criticize Flandreau and Zumer's suggestion to measure the debt burden by dividing the ratio of the "annuity" (or annual interest payment on the public debt) with tax revenues.[34] They suggest using nominal debts

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[28] . Ferguson and Schularick ("Empire effect", p. 295) argue that controlling for time effects is "a crucial advantage here because [they] need to take account of global interest rate shocks affecting all countries in a specific year."

[29] . The reason is that we are not concerned here with organizing a beauty contest between the two models. As shall appear later, both are mis-specified.

[30] . Ferguson and Schularick, "Empire effect", p. 294.

[31] . A similar point, may be made for their measurement of the gold dummy which they specify in reference to a distinction between "de jure" and "de facto" definition. They also include the gold dummy à la Obstfeld and Taylor (as a multiplier), rather than à la Flandreau and Zumer (as a straight dummy).

[32] . Eichengreen and Portes, "Debt Restructuring".

[33] . Obviously no measure is better per se, but as changes in measurement can induce changes in results a discussion would be in order.

[34] . Ferguson and Schularick, "Empire effect", p. 292.

instead. But this is not consistent with their recommended strategy to work with variables monitored by contemporaries.[35]

Table 1. Empire vs. Fundamentals ? (Results from FZ and FS)

	Flandreau and Zumer (2004)	Ferguson and Schularick (2006)	
	Table 1, p. 38, "All Countries"	Table 3, col. 2, p. 299, "All"	Table 3, col. 4, p. 299, "All"
Sample	Sovereigns	Sovereigns and colonies	Sovereigns and colonies
Period	1880-1913	1880-1913	1880-1913
N	480	1294	1147
Debt Burden			
- Interest Service/Revenues	7.75 (8.50)***	--	3.11 (3.28)***
- Nominal Debt/Revenues	--	0.12 (3.53)***	--
Deficit			
- Budget Balance/Revenues	0.73 (3.16)***	-0.11 (0.72)	-0.10 (2.10)**
Trade			
- Trade Openness	0.60 (1.59)	--	--
- Ln (Exports/Population)	--	-0.32 (1.59)	0.02 (0.24)
Crisis			
- Default	4.84 (21.66)***	3.21 (6.27)***	2.68 (4.74)***
- Memory of default	0.70 (2.56)**	--	--
- Previous default	--	1.42 (3.65)***	1.18 (2.47)**
Colonial status			
- Empire effect	--	-1.57 (5.05)***	-0.82 (3.19)***

Sources : Flandreau and Zumer (2004) and Ferguson and Schularick (2006). Period: 1880-1913. Dependent variable: Interest spread over UK's consol. t-statistics in parentheses. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level. "Trade Openness" is defined as [Exports(i, t)/Population (i, t)]/[Exports (UK, t)/Population (UK, t)]. "Memory of default" is a decreasing function of the years since settlement with bondholders, or $0.5^{n*0.1}$, where n is the number of years since settlement. "Previous default" is a dummy variable taking value 1 if the country has previously defaulted. Other variables included in the regressions and not represented here are: reserves/banknotes, downward exchange rate volatility, enfranchised percentage of population and gold adherence (Flandreau and Zumer (2004)); trade balance/exports, international conflict, civil conflict and gold standard dummies (Ferguson and Schularick (2006)).

Hopefully, these matters may not be so important. Table 1 displays the broad consistency that exists between Ferguson and Schularick's results and our earlier ones. As they emphasize: "Our results support Flandreau and Zumer's emphasis on public finance as a determinant of pre-1914 bond spreads".[36] The same holds for the effect of default, and the incidence of memory. Flandreau and Zumer note that the behavior of these variables explains most of the cross-country variation in the bond spreads of sovereign countries and makes a

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[35] . As shown in Flandreau "Caveat emptor" and Flandreau and Zumer, *Making*, 19th century economists believed that nominal debts were not an adequate indicator of indebtedness. Ferguson and Schularick "Empire effect" motivate their use of nominal debts in reference to a supposed "endogeneity problem" that would undermine the use of the annuity but not that of the nominal debt. According to them, "as the debt service itself is determined by the interest rate, it is questionable whether it should be used as an independent variable to estimate the interest rate" (p. 292). This is not a robust statement because, as explained in Flandreau and Zumer, *Making*, and as contemporaries knew very well, the nominal debt capitalizes the annuity at an arbitrary exogenous interest rate, so that that the nominal debt is just as "endogenous" as the annuity.

[36] . Ferguson and Schularick, "Empire effect", p. 294.

large and significant contribution on the convergence of bond spreads before WWI. We thus conclude that, besides difference in the precise value of the parameter estimates, Ferguson and Schularick support Flandreau and Zumer's emphasis on fundamentals. The question that does remain open is: Do these authors measure properly the so-called Empire effect?

4. An alternative Test of the Incidence of Empire

Ferguson and Schularick attach much importance to the precise number for the Empire effect, which they report. Yet it ought to be said that one should guard oneself against the fetishism of figures. Consider for instance the two-stage regression framework. It rests on exploring whether there are statistically significant differences between average fixed effects for sovereign and colonies. But sub-groups of colonies tend to have much in common for a variety of reasons (think for instance of the linguistic links between self-governing subjects). There are many factors that may cause fixed effects to be related across groups. Therefore, it requires a good dose of faith to go from there to claiming that one is properly measuring an "Empire effect" and base on this a policy recommendation – even if this is only a counterfactual recommendation!

We believe that it would be less demanding and more reasonable to use such a framework as a test of the significance of imperial links, rather than as a way to "measure" the incidence of colonial subjection. In the similar vein, an alternative approach would also be feasible. Marc Flandreau explores the costs of Hungary's secession from the Habsburg Empire before World War I (through possibly higher interest rates). He estimates model (2') with the sovereign only dataset in Flandreau and Zumer and simulates the bond yields that Hungary would have paid had it been sovereign.[37] The test of the incidence of Habsburg Empire subjection on Hungary's borrowing terms is to compare this simulated spread to the actual spread (index H stands for Hungary):

$$H_0 : s_H = \hat{s}_H, \text{ where } \hat{s}_H = x_H \cdot \hat{\beta} \qquad (5)$$

If subjection to the Habsburg Empire reduced perceived default risk, one would expect the simulated spreads to exceed the actual one. In the case of Hungary, the data rejects the null that simulated and actual rates are any different, suggesting that Hungary was priced as a sovereign country. Flandreau speculates that this may have reflected investors' doubts towards the long run survival of the Habsburg monarchy.

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[37] . An alternative is to estimate (2) and assume that fixed effects are identical regardless of status (colony or sovereign).

Section III. Regression Output: Benchmark Results

What should we conclude from Ferguson and Schularick's research as far as the Empire effect is concerned? To put it differently, should we believe their claim that the reason for their retrieving a "large and significant" Empire effect has to do with their new, larger dataset? We argue below that the answer is no. To do this, we first demonstrate that the estimate of their Empire effect is quite unstable, regardless of the dataset one is working with.

One limitation of the Ferguson and Schularick's approach is that they have not organized their results in a way that makes them directly comparable to earlier findings. As a result, their larger dataset is not the only dimension in which their approach differs from others and this makes suspicious their claim that their results are rooted on broader evidence. To level the playing field, this section controls for database differences, model specification, explanatory variable specification and finally, estimation strategy.

Differences in databases are addressed by working with two alternative datasets. The first is an extension of Flandreau and Zumer's sovereign countries database (known as the *Making of Global Finance* database (or MGF, available at eh.net/databases/finance/) supplemented by new material for British colonies.[38] We refer to this extended version as the AFRZ dataset.) The second is the background material for the paper by Ferguson and Schularick, to which Niall Ferguson kindly directed us.[39] We refer to it as the FS dataset.

Differences in model specification and estimation strategy are addressed by considering the four main variants discussed above. It is important to keep in mind that the names we give them are shorthand denominations and display differences with original specifications. They capture the spirit rather than the letter of earlier regressions. Since they are nested or organized in a way that makes them directly comparable, these specifications are a convenient tool for restoring market access. The specifications we identify are: (1) the "Davis-Huttenback" (or D-H) specification, where colonies and sovereign nations are pooled and bond spreads are explained by a number of country groups dummy variables (without lack of generality, we omit the sovereign underdeveloped dummy);[40] (2) the "Flandreau-Zumer" (or

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[38] . See appendix for details.

[39] . It is available at www.niallferguson.org/publications.html. Instead of http://www.courses.fas.harvard.edu/~history/facultyPage.cgi?id=12 as indicated in Ferguson and Schularick, "Empire Effect", p. 306.

[40] . In practice, it is not possible from Davis and Huttenback, *Mammon*, to identify the sovereign countries they recognize as "developed" or "underdeveloped". Because we work with secondary market prices with one observation per year while Davis and Huttenback work with primary market prices with one observation per bond issue, results are bound to be different from those in Davis and Huttenback. Ideally, one would want to replicate also the Davis and Huttneback database and methodology. We believe this is quite feasible but also fairly demanding and leave it to future research and researchers.

F-Z) specification where only sovereign countries are used and bond spreads are explained by a number of fundamental variables; (3) the "Obstfeld-Taylor" (or O-T) specification where the same model as in (2) is used but colonies are added and a colonial dummy is retrieved from a second stage regression; and finally (4) the "Ferguson-Schularick" (or F-S) regression which is the same as the O-T regression but for the fact that the estimation includes time effects as well. Obviously, variants (3) and (4) ought to be closely related to one another.

Finally, differences in control variables specification are addressed by focusing on the list of variables that are common to both Flandreau and Zumer and Ferguson and Schularick. We include debt burdens, fiscal performance, openness, default and memory of past default. Additional explanatory variables could be considered but as the next sections of the paper shall make clear, this would not yield additional insights.[41] And since these variables come in two brands that are tied to datasets, we must use the F-Z measures when working with the AFRZ dataset, and shall use the F-S measures when working with the FS dataset.[42]

Table 2a and b report results from the four specifications with the AFRZ and FS datasets respectively.[43] The two tables are organized in a similar fashion. Model specifications and estimation strategies are presented in columns. The output is organized in lines. Lines are regrouped in three economically meaningful "blocs". The "fundamentals" bloc shows the parameter estimates and t-stats for non-Empire controls. The "Empire dummies" bloc reports the estimates of regime dummies in the D-H specification. Finally, the "Empire effect" bloc reports the incidence of Empire. In column I, it is the spread between the average interest rate for sovereign countries and the average interest rate for colonies (*à la* D-H). In column III and IV, it is the spread between the average fixed effect for colonies and the average fixed effect for sovereigns.

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[41] . In particular we have not included the gold dummy. It is not significant in Flandreau and Zumer *Making*, while Ferguson and Schularick ("Empire effect", p. 298) report what they call "mixed evidence".

[42] . Ideally one may have wanted to use FS measures with the AFRZ dataset and FZ measures with the FS dataset. However, the way the FS dataset is constructed does not allow such a systematic exercise. The following will show however that this is not a significant constraint.

[43] Ferguson and Schularick "Empire effect", p. 290, footnote 30, write that they exclude 20 observations, with yields superior to 20%, from their estimations. The online available dataset does not provide the raw data for bond yields, but only interest rate spreads. However, we have been able to identify in their database 18 observations with a spread larger than 20%, and have excluded them from our estimations. These observations are for: Colombia (1885, 1893-1896), Guatemala (1880), Liberia (1883), Peru (1880-1889), and Venezuela (1880). There is an issue with the status of countries under partial external control such as Egypt, the Ottoman Empire and Greece after 1899. For instance, Egypt started to move under foreign rule during the 1870s and its status as a sovereign country in that period is therefore questionable. In the AFRZ dataset, we drop Egypt from the early years, drop Greece 1899-1913 and do not consider Turkey at all. Ferguson and Schularick treat Egypt a sovereign country before 1883. They consider Greece and Turkey to be sovereign throughout. In performing the FS computations, we have followed their classification.

Comparing results in Tables 2a and b presents the reader with variations that can be traced to *differences in datasets and/or variable specification*. But within each table, differences across columns do outline the *pure effect of model selection on regression output*.

Table 2a. Determinants of Reputation: Alternative Methodologies (AFRZ Dataset)

	I: D-H		II: F-Z	III: O-T	IV: F-S
	Eq. (1)		Eq. (2)	Eq. (3)	Eq. (3), Time effects
	Ia	Ib	II	III	IV
Block 1: Fundamentals					
- Interest Service/Revenues	--	--	7.08 (10.96)	3.62 (10.57)	2.51 (7.57)
- Budget Balance/Revenues	--	--	0.19 (0.92)	0.04 (0.26)	0.17 (1.32)
- Trade Openness	--	--	-0.17 (-0.58)	0.00 (0.08)	-0.02 (-0.48)
- Default	--	--	6.61 (30.50)	7.05 (42.99)	7.00 (45.73)
- Memory of default	--	--	2.16 (9.92)	1.83 (10.91)	1.81 (11.54)
- Constant	1.72 (24.98)	1.72 (24.98)	-0.22 (-0.81)	0.28 (2.87)	0.96 (6.62)
Block 2: Empire dummies					
- Self-Governing	--	-0.75 (-6.69)	--	--	--
- Crown	--	-0.72 (-4.59)	--	--	--
- Egypt	--	-0.39 (-1.28)	--	--	--
- India	--	-1.11 (-3.97)	--	--	--
Block 3: Empire effect					
- Empire Effect	-0.75 (-7.60)	--	--	-0.41 (-2.08)	-0.40 (-1.93)
N	1028	1028	515	1008	1008
Adjusted R²	0.05	0.05	0.76	0.71	0.77

Sources: Authors' computations based on AFRZ dataset Period: 1880-1913. Dependent variable: Interest spread over UK's consol. t-statistics in parentheses. D-H: Davis & Huttenback's methodology; F-Z: Flandreau & Zumer's methodology, O-T: Obstfeld and Taylor's methodology; F-S: Ferguson & Schularick's methodology. For variable description see text and tables above. "Constant" refers to the mean spread for sovereign countries in columns Ia and Ib, and to the mean fixed effect for all countries in columns II and III, and IV. Country fixed effects and coefficients on year dummies not shown. For country groups' definitions, see appendix 1.

Consider Table 2a, which uses the AFRZ dataset. As can be seen, the incidence of Empire is bigger for the D-H specification than for the O-T and F-S ones. This may be interpreted as meaning that the D-H specification fails to control for other factors. We see also that the O-T and F-S specifications yield similar output, suggesting that the inclusion or exclusion of time controls is not an issue. We note as well that the Empire effect is in both cases much smaller than the 80-180 bracket from Ferguson and Schularick. Finally, when moving from the F-Z to the F-S specification some important variables such as the debt burden have an effect that is reduced (but still significant).

Table 2b. Determinants of Reputation: Alternative Methodologies (FS Dataset)

	I: D-H Eq. (1)		II: F-Z Eq. (2)	III: O-T Eq. (3)	IV: F-S Eq. (3), Time effects
	Ia	Ib	II	III	IV
Block 1: Fundamentals					
- Nominal Debt/Revenues	--	--	0.11 (3.16)	0.10 (4.18)	0.07 (3.08)
- Budget Balance/Revenues	--	--	0.08 (0.55)	0.08 (0.76)	0.13 (1.30)
- Ln (Exports/Population)	--	--	-1.50 (-6.63)	-0.89 (-6.96)	-0.02 (-0.12)
- Default	--	--	4.64 (16.01)	4.92 (21.90)	5.03 (23.11)
- Previous default	--	--	1.58 (7.51)	1.68 (10.11)	1.74 (10.84)
- Constant	3.37 (38.54)	3.37 (38.52)	2.61 (10.28)	2.08 (11.10)	2.70 (8.91)
Block 2: Empire dummies					
- Self-Governing	--	-2.44 (-12.92)	--	--	--
- Crown	--	-2.51 (-13.07)	--	--	--
- Egypt	--	-1.98 (-4.10)	--	--	--
- India	--	-2.77 (-6.00)	--	--	--
Block 3: Empire effect					
- Empire effect	-2.47 (-17.31)	--	--	-0.57 (-1.50)	-1.60 (-5.11)
N	1465	1465	777	1297	1297
Adjusted R²	0.17	0.17	0.41	0.38	0.45

Sources: Authors' computations based on the Ferguson and Schularick (2006) dataset. Period: 1880-1913. Dependent variable: Interest spread over UK's consol. t-statistics in parentheses. D-H: Davis & Huttenback's methodology; F-Z: Flandreau and Zumer's methodology, O-T: Obstfeld & Taylor methodology; F-S: Ferguson & Schularick's methodology. See text and previous table for details.

Consider now Table 2b, which uses the FS dataset. As before, both O-T and F-S estimates of the Empire effect are smaller than measured with the D-H specification. We also see that the D-H effect is substantially larger than in Table 2a owing to the fact that the average yield in the sovereign countries group is larger in the FS dataset than in the AFRZ dataset (see appendix 2). As we suggested earlier, D-H estimates of the Empire effect are heavily influenced by how sovereign countries are doing on average.

Second, comparing the elasticity of fundamentals across regressions, we observe a pattern that we already mentioned when we discussed Table 2a. When moving from the F-Z specification to the F-S specification, the size of the effect of the debt burden is reduced, although again still significant.

But what flies in the face as the most striking contrast with the previous regression, is the instability of the Empire effect: O-T and F-S estimates are quite different from one another and from what they were in Table 2a. The F-S regression provides a *significant* effect of 160 basis points that is consistent with the numbers reported by Ferguson and Schularick. The O-T regression provides a not significant effect of 60 basis points that is consistent with the

Obstfeld and Taylor results. But the F-S and O-T estimates of the Empire effect in Table 2b are not consistent with one another.

In other words, we have been able to replicate a key difference between these authors' results. And thus we are skeptical of the contention by Ferguson and Schularick that their results on the favorable effects of Empire subjection are driven by their use of a superior or larger database. Columns III and IV in Table 2b use the very same data and only differ by the inclusion of time effects. The observed differences can be accounted for by differences in specification -- the inclusion of time effects in the regression.

In the end, the measured incidence of Empire is unstable. It changes with the estimation technique and is also affected by changes in the database. Of the four estimates of the Empire effect reported in Table 2a and b, two are small, one is non-significant, and only one looks in line with the results in Ferguson and Schularick. Unsurprisingly it is derived with an estimation technique and dataset that is closest to the one in Ferguson and Schularick. Altogether, our results show that the "Empire effect" may not be robust at all.

In the remainder of the paper, we shall endeavour to make sense of the evidence above. In particular, we shall demonstrate (a) that the inclusion of colonies in spreads regressions is illegitimate; (b) that it causes regression results to be biased and explains the instability documented above and (c) that as a result the correct elasticities of yield spreads to fundamentals are reported in the "Flandreau-Zumer" column. In other words, the story we tell is not about datasets, but about specifications, market perceptions and the economic analysis of colonial institutions.

Section III. Empire and Fundamentals

A critical assumption of the Ferguson and Schularick methodology (and in fact one which they share with Obstfeld and Taylor) is that they impose a restriction on the coefficients for the effects of fundamentals: They assume them to be identical across country groups. This is a questionable assumption, in view of the consensus that Empire countries were a different lot. It is possible, for instance, that certain fundamentals do not matter in a similar fashion for an Empire country and a sovereign nation. A high debt burden could be a greater concern for a sovereign nation, owing to investors' perception that other things being equal, default is less likely for a colony.[44]

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[44] . This is suggested by Davis and Huttenback, *Mammon*, p. 179.

In fact, the list of fundamentals monitored by contemporary investors which Flandreau (2004) and Flandreau and Zumer (2004) have identified from archival and secondary sources only pertain to sovereign nations. Therefore it is quite a stretch to assume that these operated for colonies as well, and in the very same way. For our part, we would be very reluctant to draw such an inference.[45] On the other hand, we understand from the methodology in Ferguson and Schularick, which they say is based on contemporary sources, that they have identified material suggesting that this was the case.[46]

Fortunately, there is another way to settle the discussion. The database from Ferguson and Schularick and our alternative one provide a simple way to test the assumption that colonies and sovereigns behaved in a similar fashion but for the marginal effect of Empire subjection. To do this, one only needs to run a simple fixed effect regression of bond spreads on the same list of fundamentals as in Table 2, but this time under the assumption that the elasticity of fundamentals for both sovereigns and colonies is different. Formally, we run:

$$\begin{cases} s_{it} = x_{it} \cdot \beta + \varphi_i + \varepsilon_{it} \\ s_{jt} = x_{jt} \cdot \beta' + \varphi_j + \varepsilon_{jt} \end{cases} \qquad (6)$$

Where i is a sovereign nation and j a colony. We can then perform a simple F-Test to determine whether we can accept Ferguson and Schularick's null hypothesis that:

$$\beta = \beta' \qquad (7)$$

Results are reported in Table 3. Yield premia for sovereigns were very sensitive to fundamentals while those for colonies were not. Whatever the dataset we use, the null hypothesis that parameters were the same is rejected. The conclusion from this is that fundamentals mattered in very different ways depending on whether countries were sovereign or not.

Since a good sketch is often better than a long speech, Figure 1 shows a scatter plot of default probabilities for individual countries and years as a function of the debt burden.[47] As can be seen, there are really two different clouds and they do not overlap. In the first one default probabilities are an increasing function of indebtedness. This corresponds to sovereign countries.[48] In the second one, we see that default probabilities are irresponsive to changes in debt burdens. It corresponds to colonies.

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[45] . Flandreau and Zumer, *Making*, p. 38

[46] . This was confirmed through private exchanges with Niall Ferguson who told us that his list of variables emerged from his earlier work with the Rothschild archives.

[47] . Default probabilities are computed as $\pi_{it} = (r_{it} - r_{ukt}) / (1 + r_{ukt})$. See Flandreau and Zumer, *Making*, for details.

[48] . It is essentially similar to that depicted in Flandreau and Zumer, *Making*, p. 40
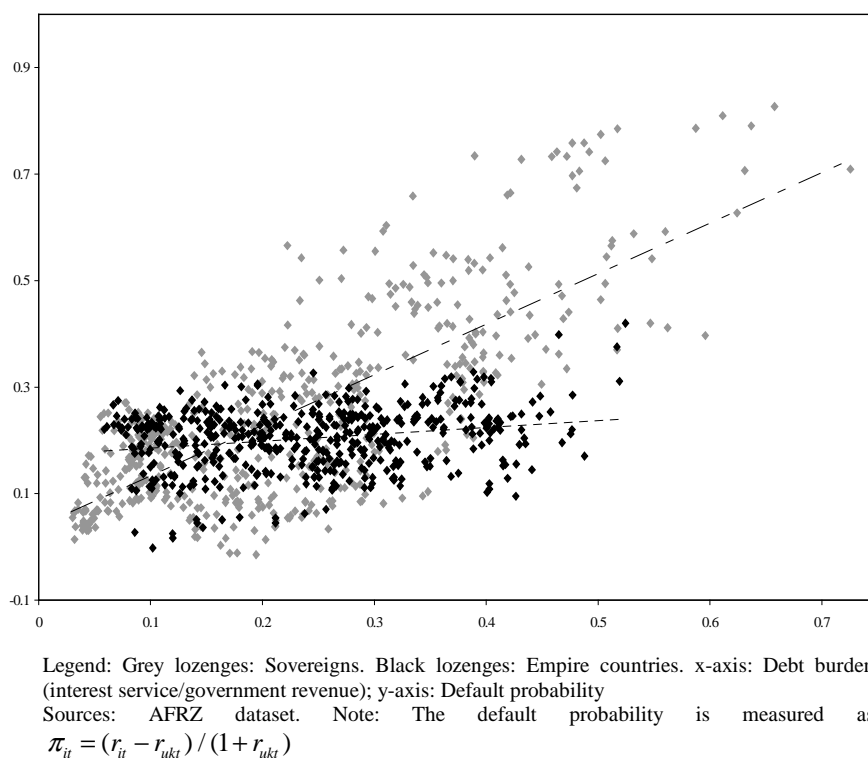
Table 3 : Elasticities of Spreads to Fundamentals : Sovereign vs. Empire countries

	Eq. (6)	
Dataset	AFRZ	FS
Debt Burden		
Interest Service/Revenues * Sovereign	7.08 (14.72)	--
Interest Service/Revenues * Empire	0.37 (0.80)	--
Nominal Debt/Revenues * Sovereign	--	0.11 (4.02)
Nominal Debt/Revenues * Empire	--	0.01 (0.33)
Deficit		
Budget Balance/Revenues * Sovereign	0.19 (1.24)	0.08 (0.69)
Budget Balance/Revenues * Empire	-0.43 (-1.55)	-0.00 (-0.02)
Trade		
Trade Openness * Sovereign	-0.17 (-0.78)	--
Trade Openness * Empire	0.02 (0.58)	--
Ln(Exports/Population) * Sovereign	--	-1.50 (-8.43)
Ln(Exports/Population) * Empire	--	-0.24 (-1.30)
Crisis		
Default	6.61 (40.95)	4.64 (20.37)
Memory of default	2.16 (13.31)	--
Previous default	--	1.58 (9.56)
Constant	0.31 (2.54)	2.03 (10.66)
N	1008	1297
Adjusted R²	0.74	0.40
F-Test *Eq. (7): Equal elasticities across groups*	F (3, 968)= 35.82 Prob>F= 0.00	F (3, 1229)= 10.70 Prob>F= 0.00

Sources: Authors' computations from a) our dataset (AFRZ), b) Ferguson and Schularick's (2006) dataset (FS). Period: 1880-1913. Dependent variable: Interest spread over UK's consol. t-statistics in parentheses. Variables are the same as in table 2. "Constant" refers to the mean fixed effect. Country fixed effects are not reported. F-test: Equation (7): H_0: $\beta = \beta'$.

We can now state this paper's first finding: In view of the unambiguous rejection of the restriction (6) and the evidence in Figure 1, we conclude that the model used by Ferguson and Schularick is mis-specified. Basic econometric theory tells us their estimates of the "Empire effect" and of the fundamentals' parameters are biased. While a later section will determine the precise direction and size of these biases, we now deepen our foray into the economics of Empire and provide an interpretation for the above results.

Figure 1. Elasticity of Default Probability to the Debt Burden:
Sovereign vs. Empire countries

Legend: Grey lozenges: Sovereigns. Black lozenges: Empire countries. x-axis: Debt burden
(interest service/government revenue); y-axis: Default probability
Sources: AFRZ dataset. Note: The default probability is measured as
$\pi_{it} = (r_{it} - r_{ukt}) / (1 + r_{ukt})$

Section III. Colonies as Sub-Sovereigns: a Detour

In this section we uncover and test a model that can be thought of as a reasonable characterization of colonial pricing. As recommended in Flandreau and Zumer in their *Making of Global Finance* we do this by following the "grass-root" approach, i.e. start from first principles and primary evidence and then produce a testable proposition that we examine against available data.

a) Moral Hazard and the British Empire: An Institutional Perspective

By definition, sovereignty provides scope for moral hazard. Suppose that a government borrows abroad to construct, say, a railway line. Now, that government decides to suspend interest service. In principle, there is a line that could be seized by bondholders. But it is located in a foreign country: rulings from local courts against local governments are needed and these may be difficult to secure. This is not to say that creditors are entirely helpless.[49]

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[49] . They could rely on bondholders associations, issuing banks pressure and occasionally home government diplomatic, commercial or military sanctions to try and persuade defaulters to settle. A literature discusses the merits and effectiveness of these alternative mechanisms. On bondholders, see Mauro et al. *Emerging markets*, Tomz *Reputation*. On financial intermediaries market power and market access see Flandreau and Flores

But the point is that it is in the nature of sovereign debts that, if defaulted upon, investors have no robust legal framework to help them recoup their claims.

However, when it came to colonies within the British Empire, investors' ability to monitor borrowers was supported by a variety of powerful arrangements. The very wording "sovereign debt" in this context, is inadequate. Sovereign default as was occasionally practiced by sovereign countries was not an option for colonies owing to the existence of two alternative monitoring regimes. The first relied on political control and implied fiscal juniority of the colony. The cabinet in London provided financial guidance either by integrating colonial finances into the general budget, or by subjecting them to metropolitan approval. Implicitly or explicitly, the metropolis underwrote colonial debts and default was thus no more an option than default on British debts.

This regime applied where native people were predominant, as was the case in India and the Crown Colonies. After the Sepoy Mutiny of 1857, India, which had formerly been run by the East India Company, was placed under the authority of a Secretary of State who was a member of the British cabinet. Debts could not be contracted without the approval of the India Office. In the Crown Colonies, such as Ceylon or Jamaica, finances were run by a London appointed bureaucracy, the "Crown Agents". The Crown Agents were London based private monitors who acted on behalf of the British Government. They were responsible for marketing in London the securities of the Crown Colonies. They kept the finances of the dependent colonies on a tight leash. They could and did veto external loans when "prospects for borrowing appeared doubtful".[50]

The second regime applied where whites dominated numerically, i.e. in Canada and the Australasian settlement colonies. In this group, local authorities could decide on borrowing, and London could not interfere much. The American War of Independence had taught Britain that strict political subjection was not an option where it was reluctant to use violence and coercion. The result was that direct interference from London was tempered.

But then moral hazard could re-emerge with a vengeance, and this was a concern. The solution, which emerged and consolidated gradually, was that the colony becomes legally junior. Had local parliaments relied on strategic default, they would have faced creditors' intervention following precise legal and constitutional rules. Very much like private firms, they were subjected to the judicial system. Creditors would have been able to sue defaulters in

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"Bonds". On gunboats and trade sanctions see Mitchener and Weidenmier "Supersanctions", but compare with Platt, *Finance*.

[50] . Kesner, *Economic Control*, p. 61: "In particular, they were outspoken regarding the ability of certain colonies to borrow money on the open market to provide for public work projects".

Imperial courts, and assets would have been seized. Management or liquidation of the railway line would have been transferred to bondholders. Had local governments tried to interfere, that would have created a breach of existing contractual and constitutional arrangements between the colony and the metropolis, providing scope for Britain to intervene. Perhaps most critically, local capitalists holding these securities would have sought the support of Britain backed legal mechanisms for protecting property rights. Local governments could not stand in the way of justice.

This second regime did not emerge overnight. At the beginning, legal arrangements as to which jurisdiction would be competent in case of problem, what would be the respective responsibilities of the Cabinet in London and the local government etc. were not very clear. During the 1860s colonial borrowing expanded and the need for a sounder institutional framework made itself felt. The British government was reminding both investors and borrowers that the Cabinet was not responsible for the debts incurred by self-governing colonies. For instance, a dispatch from Lord Kimberley to Governor Fergusson of New Zealand indicated in 1874: "Inasmuch as [the British Cabinet] exercises no interference or control as to the financial policy of a colony under responsible government, it shares none of the responsibility for the due payment of the principal and interest of loans which it has not specifically guaranteed."[51]

That it had to issue such statements suggests that confusion was possible. Before 1877, the pivotal institution to deal with moral hazard was known as "Imperial conditionality". Debts issued under "Imperial Guarantees" carried London underwriting that could be rescinded in case of colonial government misbehavior. However, in the 1870s, the English Treasury became increasingly nervous that this was not a credible solution. There had been a case where money borrowed by Canada had been used for a different purpose than initially stated, yet the guarantee had not been rescinded.[52] The British Government feared that political transaction costs would make it hostage to the Dominions.

The solution that was eventually found was to create legal workouts to help the market deal with trouble. First, the Colonial Stock Act of 1877 set the conditions under which colonial debts could enjoy the benefits of "registration":[53] This required that one should accept that English courts be competent in case of disputes (Colonial Stock Act of 1877,

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[51]   Dispatch from Lord Kimberley to Governor Fergusson, December 12, 1873, New Zealand Parliamentary Papers 1874. 1874 A-2 p. 17. cited in *London Stock Exchange Official Intelligence*, 1900, "Crown Colonies".
[52] . Davis and Huttenback, *Mammon*, p.171.
[53] . Registration enabled the issuing government to inscribe the said stock with the Bank of England, thus exempting it from stamp duties and facilitating transfers within the British Empire.

Section 20). The Act also stipulated that the Colonial Government having issued that stock would undertake to recognize the judgment of the court, and furnish its agents in London with funds for the payment of any amounts for which they may be declared liable. In sum, the Colonial Stock Act of 1877 put the judicial system in the driver's seat.[54]

When the Colonial Stock Act was adjusted in 1900 (at the request of the Canadian Premier W. S. Fielding), the same principle was again restated. The Act was aimed at giving more liquidity to the debts of the self-governing colonies by giving them "trustee status" and thus encouraging British middle class investment.[55] This benefit was secured in exchange of recognition by colonies of the junior nature of their legal system: The Act required colonial governments to place on record a declaration that any future colonial legislation altering current provisions to the injury of stockholders or involving any departure from the original contracts would properly be disallowed by the Imperial government (*The Economist*, 23 June 1900, p. 875). As far as debts were concerned, colonial legislation was subordinated to English law and Imperial arbitration. Self-governing colonies were fiscally sovereign, but not judicially sovereign.

b) Colonial Regimes, Sovereignty Regimes

To what extent did the market put faith in the ability of these mechanisms to prevent default? Marc Flandreau reviews the list of signals, which investors received, suggesting that colonial securities were not quite like other securities.[56] The prices of Indian securities were listed with "British stocks" and *The Economist* reported that England directly governed India. The debt of dependent and self-governing colonies were frequently "inscribed" with the Bank of England, a special status that provided liquidity services and was only almost never granted to foreign countries. And so on.

The credibility of H. M.'s Government's willingness to enforce legal contracts in the colonies was ascertained in an article published in January 1874 by *The Economist*. The article claimed that Britain's commitment to protect creditors stemmed from the fact that it had no other alternative, since bail out was not an option.[57] After recognizing that the Imperial Parliament could not be held responsible for the payment of colonial loans, and would thus

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[54] . As suggested by Flandreau, "Home Biases". If a metaphor is needed here, self-governing colonies relied on a radical version of the international bankruptcy courts that have been proposed as a solution to recurrent debt crises.

[55] . Trustees were supervisors of investment funds for the middle class and, as such, subjected to rules of prudence and transparency (See Stebbings, *Private Trustee*).

[56] . Flandreau, "Home biases", p.9.

[57] . "Imperial Responsibility For Colonial Loans", *The Economist*, 3 January 1874, p.6

escape a direct liability, it argued, following Robert Vogel, then prime minister of New Zealand, that Britain's Government would not escape the legitimate demand of its subjects *that the law would be enforced*. This checked moral hazard, and explained why investors "could feel sure that […] none of the colonies commit default", a perception that did underlie "in great measure the causes which have contributed to make persons willing to pay higher prices for colonial loans than for the securities of any other country except those of Great Britain and, I believe, Belgium."[58]

In a similar vein, French economist Paul Leroy-Beaulieu (an expert in government finance and a source of Flandreau and Zumer's analysis of late 19th century indicators of the determinants of sovereign debts spreads) argued that colonial arrangements eliminated default risk:[59]

> "It is better, other things being equal, to export one's capital in one's own colonies than in thoroughly foreign countries. *One is surer to find in the former a good administration, a balanced justice, a more favorable reception and a fairer treatment from the public and the government.* There are countries inclined to deal ruthlessly with foreign capital when they think they can do away with foreign support. From that point of view, the risks incurred by capitalists are smaller in colonies *which are in some sense the extension of the metropolis*".

This latter statement suggests a comparison: One should liken colonial debts not to the debts issued by foreign sovereign nations, but to states' debts in a federal country, or to those issued by cities in a unitary one. This is not just a metaphor. In the case of Crown colonies, the "Colonial Loan Fund Act" of 1899 (which preceded the much discussed adjustment of the Colonial Stock Act in 1900) was patterned after the so-called Local Loans Act of 1887. The connection was explicit in the public bill.[60] It was also frequent in the commentaries of the press implying that investors must have understood it. The London Stock Exchange Official Intelligence, for instance, referred to the "Colonial Loans Fund" being on the "model of the Local Loans Fund".[61] This was likely to create an association, in investors' mind, between the securities of British colonies and those of British cities or Municipalities.

Observers did not wait for the Act to see the parallel. The opinion of Hyde Clarke, a secretary of the Foreign Bondholders Association is interesting. While discussing an article

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[58] . *Ibid*, p.6.
[59] . Leroy-Beaulieu *De la colonisation*, p. 710.
[60] . The title [2] stated : "The advances authorized by this Act shall be local loans within the meaning of the National Debt and Local Loans Act 1887, and that Act shall apply accordingly". *Colonial Loans Act, 1899 62 & 63 Vict*.
[61] . *London Stock Exchange Official Intelligence*, 1900, "Crown Colonies", p. 1.
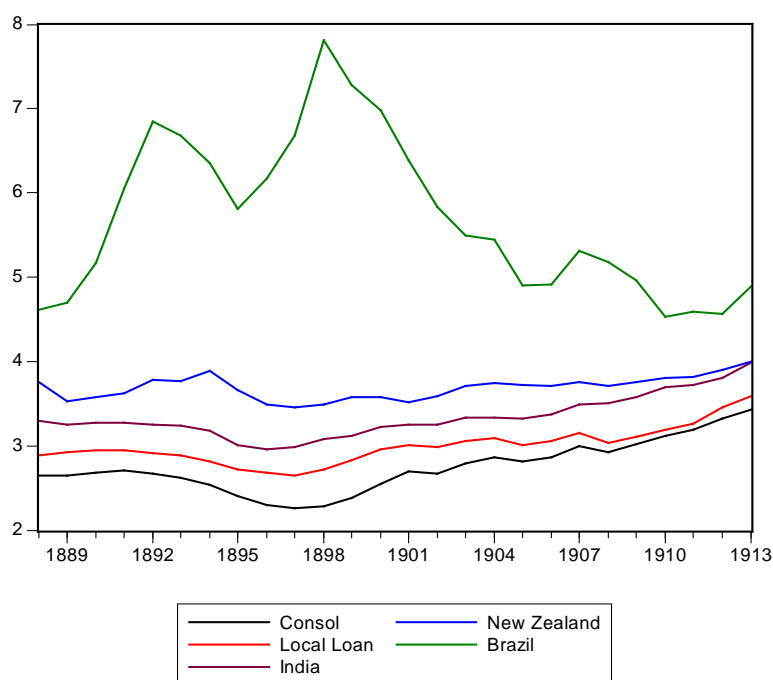
by George Baden Powell on colonial borrowing presented before the *Colonial Institute* in the late 1880s he declared:[62]

> "I am sure we must all feel that my hon. friend the lecturer has brought before this meeting a subject [Colonial Government Securities] of very great importance… We are indebted to the hon. gentleman for calling attention to the fact *that the debts of the Colonies are not to be compared with the national debts of other countries* …. This I have long maintained on behalf of the Colonies. I am very much surprised that coming as he does from the benches of the House of Commons, *he has not made the comparison, which would be a very close one indeed, of the new local debt which has been instituted by Mr. Goschen*. That transfer of a portion of the National Debt to the local liabilities of this country is a *much nearer analogy to the colonial debts than those, which have been commonly adopted*. It is a great importance that the distinction should be known, because *we have lately a great number of false comparisons and false statistics*." (p. 284, our italics)

This is our central contention. The essence of Empire was to create sub-sovereign entities. Figure 2 illustrates this point by comparing the yield on British consols, the yield on securities issued under the Local Loan Act, the yields on two British colonies (New Zealand and India) and the yield for one sovereign (Brazil).

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[62] . Baden Powell, 1886-87, "Colonial Government Securities", p. 284. In the 1870s, Clarke had been wary that, without proper, colonial debts might be defaulted; see Clarke "On the debts".

Figure 2: Local, Empire and Sovereign Loans

c) Empire countries as Sub-Sovereigns : A Test

The view that emerges from the above discussion of anecdotal and verbal evidence is that, owing to a variety of institutional regimes, colonial bonds were closely tied to those of the metropolis. We are now ready for a test.[63] One way to represent the evidence is to say that the pricing of bonds was set to operate along two distinct economic rationales or regimes. First, the colonies: we argue they were essentially borrowing at the same cost as the metropolis plus a small constant ϕ_i that might be country specific and which captures a number of time invariant country specific factors, such as liquidity premia, perhaps related to the size of the outstanding issues at date t, etc.[64] Second, the sovereigns: we assume that for them, pricing

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[63] . Davis and Huttenback, *Mammon*, pp. 169-170, wonder why investors could feel particularly confident with the debts of white colonies. Whereas the recognition of continuing government scrutiny helped make the issues of dependent colonies attractive to investors, it is not so clear why those investors maintained confidence in Dominion issues. Clarke ("Sovereign and quasi-sovereign states" p. 333) argues: "Under the new system of colonial administration, all except the crown colonies, (…) it is not difficult to foresee that in case of pecuniary liability, that there would be no more real remedy for creditors of the Dominion of Canada of the federation of New Zealand, or of that of South Africa, than there is against Virginia and Louisiana". He would retreat later on as indicated in the footnote above. We also remark that in the midst of the Australian crisis of 1893, yields differentials climbed at some point to 116 basis points for New South Wales, 135 basis points for Victoria and to a maximum of 147 basis points for Queensland. We leave open the question whether this was pure default risk, or the result of fire sales of safe securities.

[64] . We recognize that this is a simplification and that future research may be well advised to take a closer look at the fine spreads that nonetheless exist among colonial securities and to their minute determinants. However,

rules worked as in Flandreau and Zumer (2004) with fundamentals (debt burdens and so on) determining bond spreads. The resulting model is:

$$\begin{cases} s_{it} = x_{it} \cdot \beta + \phi_i + \varepsilon_{it}, & \text{if i is a sovereign} \\ s_{it} = \phi_i + \varepsilon_{it}, & \text{if i is a colony} \end{cases} \qquad (7)$$

The critical insight that this captures is that colonies' borrowing conditions were irresponsive to their own "fundamentals" (or much less responsive than observed for sovereign countries). Note that this is a quite extreme way to interpret the previous qualitative evidence. A weaker version would be to say that bond spreads for colonies are less responsive to fundamentals than bond spreads of sovereign nations. In any case, a straight test of whether model (7) is true is to run the following regression:

$$\begin{cases} s_{it} = x_{it} \cdot \beta_0 + \phi_i + \varepsilon_{it}, & \text{if i is a sovereign} \\ s_{it} = x_{it} \cdot \beta_0 + x_{it} \cdot \beta_1 + \phi_i + \varepsilon_{it}, & \text{if i is a colony} \end{cases} \qquad (8)$$

And test whether:

$$\beta_1 = -\beta_0 \qquad (9)$$

Table 4 reports the results. The null $\beta_1 = -\beta_0$ cannot be rejected in a F-Test. We conclude that bond spreads in colonies were essentially irresponsive to underlying fundamentals.

d) The Miscalculations of Empire.

We are now able to explain the reasons for the results in Table 2. While the appendix provides a formal discussion, the intuition is straightforward. Table 2a and b showed an incidence of fundamentals on borrowing costs that was smaller in F-S regressions than in the F-Z ones. This result is obvious now. The F-S regression, which applies the same model to sovereigns and colonies is mixing apples and oranges. Consider the debt burden: it is important for sovereigns but not for colonies. The F-S bias arises by averaging two parameters, one of which is essentially zero, thus causing an under-estimation of the other.

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given the existing confusion of the literature, this simplification is useful and will outline our point in the clearest light.

Table 4: Colonies as Sub-sovereigns: A test

Dataset	Eq. (8)	
	AFRZ	FS
Debt Burden		
Interest Service/Revenues	7.08 (14.72)	--
Interest Service/Revenues * Empire	-6.71 (-10.08)	--
Nominal Debt/Revenues	--	0.11 (4.02)
Nominal Debt/Revenues * Empire	--	-0.10 (-1.88)
Deficit		
Budget Balance/Revenues	0.19 (1.24)	0.08 (0.69)
Budget Balance/Revenues * Empire	-0.62 (-1.96)	-0.08 (-0.29)
Trade		
Trade Openness	-0.17 (-0.78)	--
Trade Openness * Empire	0.19 (0.87)	--
Ln (Exports/Population)	--	-1.50 (-8.43)
Ln (Exports/Population) * Empire	--	1.26 (4.95)
Reputation		
Default	6.61 (40.95)	4.64 (20.37)
Memory of default	2.16 (13.31)	--
Previous default	--	1.58 (9.56)
Intercept	0.31 (2.54)	2.03 (10.66)
N	1008	1297
Adjusted R²	0.74	0.40
F-Test *Eq. (9): Colonies as Sub-sovereigns*	F (3, 968)= 1.60 Prob>F= 0.19	F (3, 1229)= 0.67 Prob>F= 0.57

Sources: Authors' computations from a) our dataset (AFRZ), b) Ferguson and Schularick's (2006) dataset (FS). Period: 1880-1913. Dependent variable: Interest spread over UK's consol. t-statistics in parentheses. Variables are the same as in table 2. "Constant" refers to the mean fixed effect. Country fixed effects are not reported. F-Test : Equation (9): H$_0$: $\beta_1 = -\beta_0$.

Table 2 also showed that the average estimated Empire effect under the O-T and F-S methodologies increases with the average spread for sovereign countries. It thus behaves somewhat like D-H estimates of the Empire effect. The intuition for this property of the results is the following: the F-S methodology has the consequence of downplaying the effect of fundamentals when many colonies are included. The more you add colonies and the larger is the underestimation: In the end, one is left with an Empire effect, which is by construction bound to be related to that from D-H regressions, as seen in Table 2. Given the large number of colonies that Ferguson and Schularick have taken care to include in their sample (they represent about 40% of the population of individual countries), their method ends up being empirically similar to running D-H regressions. And thus in the end, the Ferguson and

Schularick approach which sought to improve on D-H by controlling for "other factors" ends up replicating it.[65]

To conclude, a word of caution in order regarding other works that include "colonial countries" in sovereign bond spreads regressions. We have seen a number of earlier articles and current drafts using similar methodologies and we suggest they are facing similar challenges. If our points are sustained, researchers should be reminded that "colonial countries" are not really "countries" in a number of respect so that the adequacy of their use in any panel regression should be considered with caution. The case of bond spread regressions makes this point in a particularly striking way, but one could think of many other dimensions where colonial institutions have systematic effects on reaction functions. We are agnostic regarding the precise extent of the biases that ignoring this would entail in these studies. In the context of bond spread determinations a reasonable approximation would be to use the proportion of colonies in the sample as an indicator of the size of the problems.[66]

Section V. Black Man's Burden: Financial Support and Financial Repression.

a) Slave Nations Owing Nothing

The previous discussion has given some evidence on the determinants of borrowing costs for both colonies and sovereign countries. We now provide a measure of the gain from credibility transfers received by colonies. A natural way to get about this is constructing an estimate of the credibility losses from gaining independence, other things being equal.

Davis and Huttenback's measure was to multiply the interest rate reduction from being a colony by the total amount of capital that the colony received from London.[67] As shall appear

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[65] . The similarity between the interest reduction measured by Davis and Huttenback on the one hand and by Ferguson and Schularick on the other hand, and which Ferguson and Schularick do emphasize ("Empire Effect", pp. 302-303), is thus somewhat predictable and obviously not a reason for reassurance, since we have proved that the two estimations are essentially identical, provided that the number of colonies is "large enough". Note also that Ferguson and Schularick's claim to similarity of findings comes from an incomplete reading of Davis and Huttenback. While it is true that Davis and Huttenback conclude on the basis of interest rates only that "within the Empire, India consistently paid less for capital than either the dependant colonies or those with responsible government." (*Mammon*, p. 174) they hasten to add, only two pages later, on the basis of their estimates of the "subsidy" obtained by multiplying the interest reduction by the amount borrowed, that "across the entire Empire, savings … were not evenly distributed. The colonies with responsible government received the most." (*Mammon*, pp. 175-176).
[66] . Published works include Obstfeld and Taylor "Sovereign Risk", Mauro, Sussman and Yafeh, "Emerging Markets" and *Emerging Markets*, Mitchener and Weidenmier, "Baring Crisis". The study by Obstfeld and Taylor includes 5 colonies, representing around 18% of their 27 countries sample. The article and book by Mauro, Sussman and Yafeh includes Canada and Queensland as well as Egypt (a British Protectorate after 1882). That's close to 17% of their 17 countries sample. The paper by Mitchener and Weidenmier has one regression with 21 sovereigns and 14 colonies or protectorates. That's about 40% of the sample.
[67] . Davis and Huttenback, *Mammon*, p. 175. In their framework (pp. 192-193), just as in the one we develop later on, this measure is an upper bound for the actual surplus for being a colony.

later, this approach is questionable. But the computation is nonetheless a convenient starting point with heuristic value. Therefore, we assess first the interest rate saving computed by comparing the actual price that colonies paid to that which they ought to have paid *had they been sovereigns*. In the framework discussed above this is estimated by using the colonies' fundamentals in the sovereign bonds pricing model (5).[68] Second, we estimate the subject's surplus by multiplying the interest rate reduction by the amount of total capital received (both public and private) as given by Irving Stone.[69]

Table 5 reports various items used for deriving this measure and thus enables one to track down the elements of the computation. The first column provides an estimate of the debt burden (the interest service as a share of government revenue) that is the relevant element for pricing sovereign nations. The second column gives the counterfactual interest reduction, which is the difference between the interest paid by the colony and the interest it would have paid, had it been sovereign. The third column provides a measurement of the benefit from Empire, measured by multiplying the interest reduction by the amount of capital received. This benefit is compared to GDP (column 4) and population (column 5).

Results in Table 5 show that dependent colonies did not gain much.[70] This arises because their governments do not display high indebtedness ratios, which is quite natural given the tight fiscal controls from London, to which they were subjected. When these ratios are substituted into the counterfactual sovereign country formula, they yield borrowing terms that are not very much above British consols. In other words, it is difficult to identify a benefit from subjection in the case of dependent colonies, because dependent colonies had very small government debts, and ought not to have paid high premia, had they been free and maintained similar fiscal stances. Moreover, we see that these countries were not very heavy total borrowers either. Multiplication of the two items does not produce a very high subsidy.

By contrast, the governments of self-governing colonies display a much higher subsidy. This arises from both terms. First, they had larger government debt ratios, which may be seen as a reflection of their not facing any fiscal constraint from London. When applied to the sovereign bond spread equation, these high debt burdens yield mechanically higher

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[68] . See Flandreau, "Logic of Compromise", for an earlier discussion of these matters.

[69] . Stone, *Export of Capital*. This assumes that sovereign bond spreads measure the cost of borrowing for both governments and corporations. This is a reasonable simplifying assumption, which holds when government bonds provide a benchmark for corporate borrowing. In this case, improvements or deterioration in government bonds spreads are passed on to private borrowers

[70] . This is not unlike what Davis and Huttenback had suggested, although we find even less of an effect, because our measured interest rate reduction is substantially smaller than theirs.

counterfactual borrowing costs. Their economies also borrowed a lot more and combination of the two effects yields a not trivial "benefit" from Empire.

Table 5. The Empire Subsidy

	I Interest Service/Revenue	II Interest Saving (in %)	III Annual Subsidy (in Mio £)	IV Subsidy as % of GDP	V Subsidy Per Capita (in £)
Self Governing					
- Canada	0.25	1.80	6.34	2.94	1.14
- Cape	0.25	1.74	--	--	--
- Natal[*]	0.19	1.36	--	--	--
- New Zealand	0.36	2.53	1.56	4.73	1.99
- New South Wales	0.23	1.62	--	--	--
- Queensland	0.33	2.31	--	--	--
- South Australia	0.34	2.38	--	--	--
- Tasmania	0.35	2.47	--	--	--
- Victoria	0.24	1.68	--	--	--
- Western Australia[**]	0.18	1.28	--	--	--
- Average Australia	0.28	1.96	5.87	2.84	1.69
- Average Self-Governing	0.27	1.92	4.59	3.50	1.61
Crown colonies					
- Ceylon	0.13	0.91	0.14	0.41	0.04
- Jamaica	0.14	1.01	--	--	--
- Mauritius	0.10	0.73	--	--	--
- Average Crown Colonies	0.12	0.88	0.14	0.41	0.04
Egypt[***]	0.37	2.64	1.25	1.57	0.12
India	0.18	1.25	3.14	0.19	0.01

* : Crown colony until 1892 ** : Crown colony until 1889 *** : 1886-1913 only.
Sources : Interest service/Revenue and Interest Saving : authors' own dataset (see appendix 1) and computations ; Capital Calls : Stone (1999) ; GDP : Australia: Vamplew (1987); Canada: Urquhart (1993); Ceylon: Data for GDP per capita provided by Jeffrey Williamson, India, New Zealand: Maddison (2003) ; Population: Australia, Canada, Ceylon, India, New Zealand: Maddison (2003), Egypt: Mitchell (2003). Column I: Annual average of Interest Service/ Government Revenue; Column II: Annual average of counterfactual interest reduction (see text); Column III: Annual subsidy= $K_i*(R_{i,s}-R_{i,c})/R_{uk}$, where K_i is the average amount of capital received by country i, $(R_{i,s}-R_{i,c})$ the average interest reduction and R_{uk} the mean yield on UK's consol; Column IV : annual subsidy as % of average 1880-1913 GDP; Column V: Annual subsidy as % of average 1880-1913 population size.

An intermediary case is Egypt. There, external control and *de facto* colonial status arose out of a fiscal crisis. Britain's take over of Egyptian finances and government in the 1880s ensured that previous debts, once restructured, would be repaid. This caused Egypt's debt service to remain high: Britain's dominion meant that obligations would be serviced. Egypt swapped the interest rate associated with the large debt burden of a would-be defaulter for the credibility associated with Britain's rule. On the other hand, Egypt was not a very large borrower either. The total benefit is not as important as for self-governing colonies.

b) The Simple Analytics of Empire

It seems desirable now to deepen our foray and explain what is going on so that the results from our computations can be interpreted. For simplicity, we consider a small open economy framework.[71] We assume that capital displays a disinclination to migrate towards sovereign nations while colonies are an extension of the metropolis *à la* Leroy-Beaulieu. This is captured through alternative capital supply curves. We also suppose that sovereign bond spreads measure the cost of borrowing for both governments and corporations.

Figure 3. Default Risk and Borrowing Costs
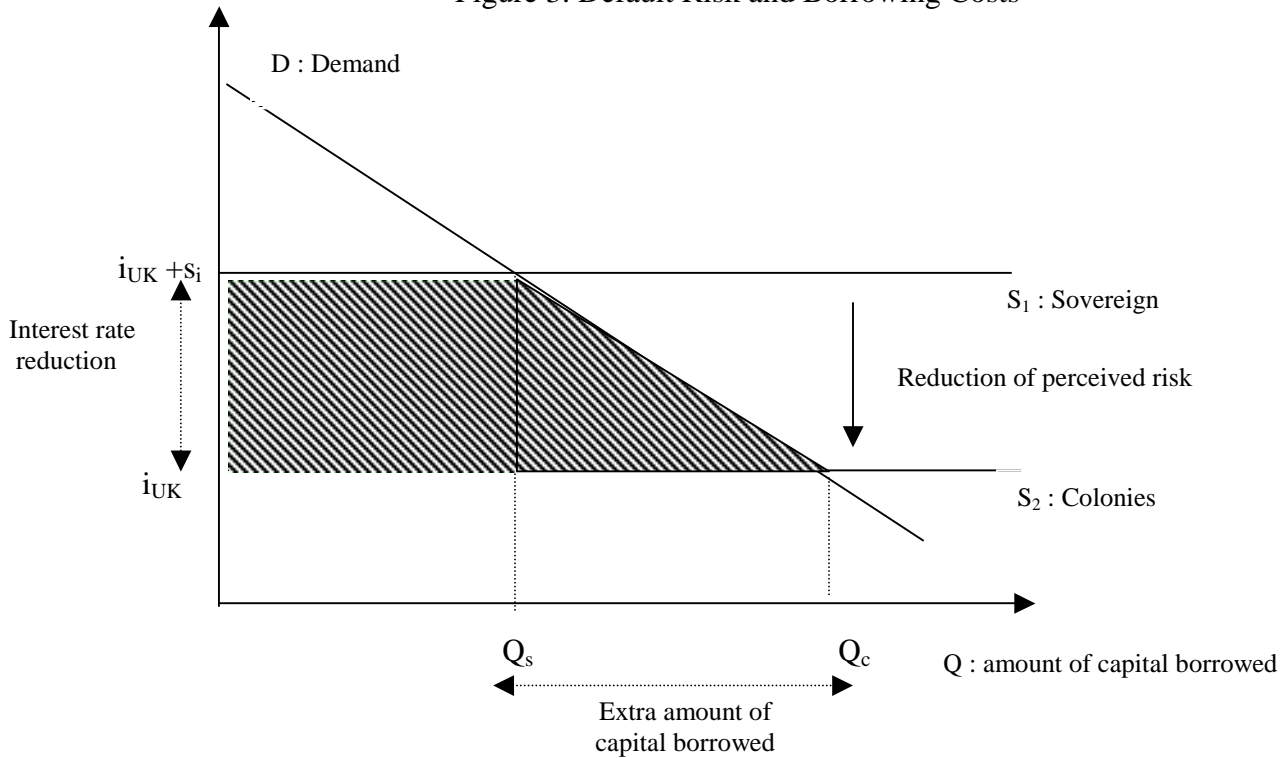
In what follows, we focus on the effect of enhanced credibility gains from colonial subjection.[72] Figure 3 illustrates what happens. Consider the situation of a small open sovereign country with a downward sloping demand for capital. It faces a flat supply schedule, whose intercept is determined by that country's interest rate (the sum of the rate on

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[71] . So that we can abstract from crowding out, although this could be considered as well. See e.g. Davis and Huttenback, *Mammon*. See also, Flandreau and Zumer, *Making*, for related model.

[72] . Davis and Huttenback (*Mammon*, pp. 167-170) argue that the decline in interest rates is caused by reduced perceived default risk. Their model (p. 192-193) describes a country switching from the colonial low risk group to a sovereign, high risk group. An alternative would be to emphasize the existence of frictions in the global capital market, which "Empire" would have helped overcome. Clemens and Williamson, "Wealth bias", discussion of the allocation of capital from London thinks of Empire as a way to fix capital market imperfections. On the first account, we note that Empire subjects did not default, neither during the period under study, nor during the subsequent, interwar period. On the second account we remark that the debates that took place in the late 1890s before the adoption of the Second Colonial Stock Act suggests that self-governing colonies' leaders were always concerned that Empire subjection was not enough to guarantee full liquidity.

British consols and the borrowing spread): Risk neutral investors are prepared to supply as much capital as needed at this price. Suppose now that the country becomes a colony. The supply schedule shifts downward, to coincide with the risk free supply schedule whose intercept is defined by the yield on British consols. As can be seen, the country now receives more capital, and of course at a lower interest rate. The surplus from subjection is $(Q_s + Q_c) \cdot s_i / 2$. This theoretical surplus can be compared with the computations in Table 4 which evaluated the surplus as $Q_c \cdot s_i$. Thus the estimates in Table 4 are somewhat overstating the benefit of Empire.

Next, we ought to remark that the previous analysis applies only to the case for self-governing, self-serving colonies. For dependent ones, the British government had the final say over individual colonies' borrowing decisions. Previous historians have reported evidence of cyclical and structural constraints for both public and private borrowers in the dependent Empire. David Sunderland argues that before 1900 British monetary and financial authorities imposed a priority rule on crown colonies. They could not tap the market when the independent area needed funding.[73] Richard Kesner gives evidence of crown colonies' dissatisfaction with restrictive market access imposed by Crown Agents.[74] Davis and Huttenback also suggest "the explanation of the relatively small level of savings rests … with the dependent colonies' hesitancy, a hesitancy that reflected at least in part the policy of the Colonial Office to use the London market."[75] They add that, while "being a British colony, whether self-governing or dependent, provided a privileged entrée to the London capital market … dependent colonies were constrained from exercising this privilege too frequently".[76]

From a theoretical point of view, rent-seeking behaviour may have helped sustain such a regime.[77] Suppose that authorities in London set a cap on a given colony's capital imports. This does maintain a wedge between rates of return (equal to the interest rates entrepreneurs would be prepared to pay given profitability of investment) and actual borrowing rates (equal to the risk free rate at which entrepreneurs borrow from London). Agents who have access to both external capital and local investment opportunities (in the instance, British firms operating in India, and British elites) can capture this rent and have an interest in the status

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[73] . Sunderland, *Managing the British Empire*, "Projects initiated at the height of such booms tended not to reach the construction stage until the independent area issue had exhausted itself", p. 152.

[74] . Kesner, *Economic control*.

[75] Davis and Huttenback, *Mammon*, p. 176.

[76] . See Davis and Huttenback, *Mammon*, p. 179-80.

[77] . Tullock "Welfare Costs", Krueger, "Rent seeking".

quo. These agents ought to massage the Colonial office, India office or the Exchequer into maintaining a high degree of financial repression so that rents are protected. Similar phenomena are well documented in today's developing economies, and are in line with the insights discussed in the first Section of this article.

Figure 4. The Gladstonian Regime: India, Crown Colonies
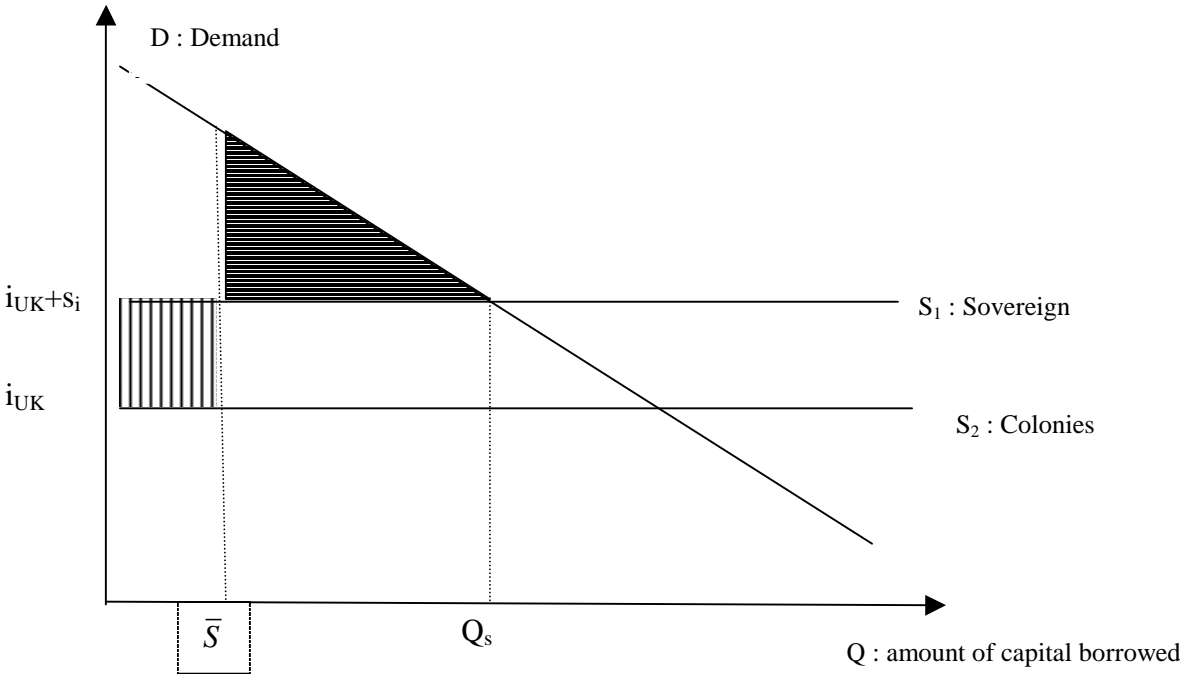
Suppose therefore that we revise the previous analysis and assume that London sets a cap ($\bar{S}$) on the total amount borrowed by the colony.[78] The country's surplus when sovereign is measured as before, but its surplus as a colony, given constraint $\bar{S}$, is a fraction only of what it was in Figure 3. If the cap is low enough, the colony loses from subjection.[79] When the counterfactual to sovereignty is becoming part of an entity subjected to financial repression, sovereignty is preferred despite the low interest rate. This is obviously the case in Figure 4.[80]

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[78] . This was implied, although not articulated, by Davis and Huttenback's insistence that dependent colonies and India may have been prevented to avail themselves of the opportunities that lower interest rates provided in principle.

[79] . This arises when the rectangle with grids is larger than the shaded triangle.

[80] . While Davis and Huttenback do not discuss the situation uncovered here, they must have implicitly anticipated it, motivating the book's closing statement, that "it is not obvious that either India or the dependent colonies would have chosen to accept the imperial subsidy had they been given the opportunity to object" (*Mammon*, from abridged edition, p. 279).

Therefore, it is not enough to remark that there is evidence of a lower interest rate under subjection to infer that subjection is a desirable state. In general, it can be shown that there is a rank correlation between the surplus measured in Table 5 and the true surplus that ought to be computed from Figure 4. A very small measured surplus, arising from low borrowing totals, is a suspicion of colonial diseconomies. This is an important result, as it enables us to interpret the findings in Table 5. The modest benefits from subjection in dependent colonies may really be telling us about underlying welfare losses.

c) Colonial Regimes: A Lucas Critique

We find these issues fascinating and suggest them for future research. But before one gets to this, there is an even more important matter that ought to be clarified. One limitation of the previous analytics is suggested by the earlier results for Egypt. As indicated, Egypt's high debt burden was endogenous to it becoming a British colony. Had Egypt not been a de facto colony, it may have considered a complete default on its external debts, as other countries in our sovereign sample did.

In other words, a country's fiscal behavior is determined by its institutional arrangements, implying that it may not be reasonable to use the colonial regime government debt burden as representative of what would happen in the counterfactual sovereignty regime. From a theoretical point of view, our insight is the familiar Lucas critique, complicated by the co-existence of two possible regimes that are associated with different pricing formulas.

To take a simple example, we suggest that the improved borrowing terms from being a colony could be compensated if that country were to go through some travail to improve its financial standing. As we found in our earlier work, credibility rewards could be achieved through other means than by surrendering sovereignty. This reasoning helps to focus where the principal effect of colonial subjection is to be found, i.e. on the fiscal incentives that it creates.

First, the governments of self-governing colonies had an incentive to borrow extensively, since this did not translate into higher bond spreads and crowding out would therefore be limited. They should be expected to accumulate public debt to an extent that may not be seen in sovereign countries, thus leading to estimated benefits of Empire subjection that overstate the actual gains. A sovereign country would be anxious to limit government borrowing for fear that this would deteriorate reputation and reduce aggregate external borrowings. This logic is illustrated by New Zealand's Premier Julius Vogel's policy of "Great Public Works"

during the 1870s, which took advantage of low borrowing rates to "launch that colony on a public-works spree".[81]

A reverse reasoning applies to dependent colonies whose governments might have accepted some deterioration of their public finance for the sake of promoting domestic human or physical capital accumulation. We expect their governments to borrow substantially more, had they been free.

To illustrate this, we assemble a few statistics on the incidence of the alternative institutional arrangements in place in different colonies on borrowing strategies. Table 6 below provides evidence for the total amount of capital received in London between 1880 and 1914, and distinguishes between dependent and self-governing colonies. Self-governing colonies for which there is enough evidence are Australia, New Zealand, and Canada. To represent dependent entities, we use India and Ceylon. As counterpart sovereign countries we have Argentina, Brazil, and Chile. We focus on these countries because they used London as their quasi-exclusive source of funding.

Table 6 indicates average annual foreign calls as a share of GDP, decomposes these calls by looking at the breakdown between private and public investments and provides evidence on debt burdens in the various groups under study. It is intended to illustrate the distortionary consequences of colonial institutions.[82]

Several features stand out. First, self-governing colonies are among the nations that received the highest amounts of capital as a share of GDP. Second, a large fraction of their capital was received in the shape of government borrowing. By contrast, Argentina, which received a lot of capital (in proportion of GDP, more than the self-governing countries), received much less in the shape of government loans. For all that has been said about the fiscal difficulties of Argentina, its government was not a conduit for foreign investments, unlike the "better behaved" countries in the self-governing group. A similar feature is also observed for the other sovereign countries that received substantial amounts of foreign capital that is, a smaller government share of aggregate external borrowings. Finally, we see that dependent colonies despite the low debt burden they had (Table 5), received little aggregate capital. Their externally imposed fiscal virtue did not crowd in private investment.

The conclusion is that self-governing colonies, had they been sovereign, would have probably reduced public borrowing, causing their counterfactual spread to decline compared

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[81] . Davis and Huttenback, *Mammon*, pp. 169-170.

[82] . These results may also be read in light of those reported by Clemens and Williamson "Wealth bias" and Esteves "Capitalism". They report a modest, or insignificant, or wrong signed, effect of the British colony dummy on the share of London capital a country received.

to the one we have measured here. The mollification of the market discipline constraint (compared to what sovereign countries faced) may thus be taken as a crucial qualitative benefit of being part of the Empire. This is the essence of "Vogelian economics" and an intriguing effect of colonial rule: that it encouraged less, rather than more, fiscal orthodoxy.

Of course, for those who doubt that government intervention can be fruitful the conclusion must be that the estimate of the benefits from subjection for self-governing colonies computed by multiplying the amount of capital borrowed and the interest rate reduction is a far out upper bound. They may register the ability to accumulate government debt in Canada or New Zealand on the liability side. Not much would be left of the "benefits of Empire".

Table 6. Financial Repression: Empirical evidence

Country	Capital Calls/GDP (in %)	Share of Government in Total Calls (in %)
Sovereigns		
- Argentina	6.87	20.54
- Brazil	3.17	42.17
- Chile	2.20	41.12
- Average	4.08	34.61
Self-Governing		
- Australia	4.46	62.89
- Canada	3.82	66.10[*]
- New Zealand	6.19	56.58
- Average	4.83	61.86
Dependent		
- Ceylon	1.27	41.45[**]
- India	0.43	51.30
- Average	0.85	46.38

Sources : Stone (1999), except for Ceylon (data communicated by Jeffrey Williamson). GDP numbers: Argentina: Derived from Flandreau and Zumer (2004) and Paolera and Taylor (2003), Australia: Vamplew (1987); Brazil: Flandreau and Zumer (2004); Canada: Urquhart (1993); Ceylon: Data for GDP per capita provided by Jeffrey Williamson, data for population from Maddison (2003); Chile: Braun et al. (2000); India, New Zealand: Maddison (2003). Notes: *: This is the sum of government calls and government guaranteed railway loans. **: 1878-1913.

On the other hand, there also exists a benign view on the rise of government spending as articulated by Peter Lindert's discussion of the rise of the welfare state or Jeffrey Sachs' reappraisal of development policies.[83] A full discussion of the extent to which enlarged government borrowing in British colonies was favourable to growth is beyond this article's reach. It would have to discuss subtle issues that relate to crowding in and complementarity.

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[83] . Lindert, *Growing Public* ; Sachs, *End of Poverty*.

Yet a few remarks are possible. First, revealed preference theory suggests that, if the governments of self-governing colonies borrowed more when allowed to, there may have been good reasons for that. Second, in view of the substantial accumulation of human capital that Britain's self-governing colonies displayed, the benefit from colonial subjection (conditional upon self-governing status) may be larger than what we measure. Without a soft government budget constraint, such a massive public expenditure as was displayed may not have been as easy.[84] In any case, the "benefit from Empire" did not arise so much through more abundant, or cheaper capital (as there were other ways to borrow cheaply and markets worked pretty well), but rather by broadening the menu of possible development strategies and permitting a considerably greater dose of government intervention.

If someone insists on drawing a lesson from Britain's colonial experience, it may simply be that financial orthodoxy and balanced books are a hindrance to economic development. As suggested in a quote from J. McDonald's book, "it is better to be a free nation deep in debt than a slave nation owing nothing".[85] India, Ceylon, and the other dependent colonies were slave nations, owed nothing, and did not grow. We doubt that this does lend support to the notion that the imperial system was conducive to global economic growth or that it does suggest importation or imposition of "less dysfunctional" economic institutions from some allegedly benevolent metropolis.

Conclusions

This article has reviewed some issues on the incidence of British Empire subjection on borrowing costs and development. In so doing we have identified pitfalls that undermine Niall Ferguson and Moritz Schularick's recent attempt at estimating the Empire effect. We found that, owing to a specification error, their effect is mis-measured. We also showed that their estimates of bond spreads sensitivity to fundamentals are biased (specifically, they underestimate true parameters).

Our article also suggests that research on the relation between Empire and default risk should be re-directed. Using contemporaries' accounts as a guide, as recommended in Flandreau and Zumer's *Making of Global Finance*, we have articulated a new view that looks at colonies as sub-sovereign entities. This view was tested and accepted using two different datasets, one having been constructed by Ferguson and Schularick.

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[84] . See e.g. Sokoloff and Engerman, as well as Lindert, *Growing public*.
[85] From Anonymous, *The Chimera: or the French Way of paying national Debts, Laid Open, London*, 1720 pp. 7-9, quoted in McDonald, *Free nation*, p 3.

Our findings motivated an alternative approach to the counterfactual measurement of the incidence of Empire. The effect of subjection depended critically on governance frameworks. These impacted the colony's capacity to absorb capital much more than the interest reduction that loss of sovereignty entailed. We found that countries that were politically managed and controlled from London (such as the Crown Colonies and India) displayed particularly modest indebtedness ratios and borrowed little in aggregate. The very small "surplus" measured for them is really, we argue, an indicator of a possible substantial net loss from colonial subjection.

Finally, we also suggested that the very specific regime in place in dependent colonies and India was conducive of rent seeking, because it combined cheap access to capital for an elite, high rates of returns, and caps on external borrowing. The subsequent poor economic performance these areas displayed may be put in relation with our findings.

Results were different for the white, self-governing, self-serving provinces, where external borrowing and government indebtedness were highest, and where the degree of autonomy was maximum. We found that the main effect of Empire subjection, in these areas, was to encourage a growth strategy that involved massive government borrowing and spending. This happened because Empire subjection provided investors with a hedge against default, for colonies were legally junior. Had such a hedge not existed, these colonies ought to have made greater fiscal efforts, or else they would have faced substantially higher borrowing costs.

In the end, the moot point for a serious assessment of these countries' surplus from colonial subjection is determined by the view that one takes of the role of public debt accumulation in the process of development. Neo-classical economists may tend to believe that government spending substituted for private enterprise so that Empire, to the extent that it facilitated fiscal profligacy, was a bad thing. Others may conclude that, in the specific, historically limited and demographically minority case of self-governing colonies, Empire subjection was helpful in enabling government to borrow much more than they would have been allowed to, had they been sovereign. The uncontroversial conclusion is that the incentives resulting from the Empire framework left deep prints in the subjects' growth strategy.

If one inference is to be made from the available variance within the British Empire, it is that the closest a country was of a regime resting on government of the people, by the people, for the people, and the better it was. In effect, one possible interpretation of the success of public spending in self-governing territories, is that it went along with a substantial measure of democracy, which made local decision makers accountable to their constituencies. This

pretty straightforward conclusion (our American friends must have known it since the Boston Tea Party!) is obviously opposite to the suggestion that loss of sovereignty and the outsourcing of economic policy to the gentlemen in London could be good for a country's development and carries a lesson for today.

Matters of political economy and racism thus played a crucial role in affecting the variance of development outcomes within colonial Empires. It is very difficult to account for the specific governance regime that prevailed in self-governing colonies if one does not keep in mind what the experience of the North-American colonies had taught British rulers: that settlement colonies needed to be kept on a fairly soft leash, otherwise the risk of losing them out was big. The political economy of secession provides insights to understand self-governing colonies' institutional design: had the white people of the time (British, French, or Americans) believed that the life of black men was worth as much as theirs, the growth prospects of the world would have been very different.

We conclude with an anecdote taken from Carl Jung's collection of essays *Man and his Symbols*. Jung recalls the case of a tribe from Eastern Africa, whose members were reported not to be dreaming at all. Upon closer inspection, however, it appeared that every single member dreamt, but the tribe believed that only dreams dreamt by the chief and shaman were worthy of attention. The chief and the shaman for their part reported a complication. They had stopped dreaming meaningful dreams a while ago. The event followed the arrival of British colonizers. Since that time, they felt that the "district chief" (the British colonial civil servant in charge of the tribe) was responsible for dreaming those privileged dreams that were destined to have a powerful influence on the tribe's everyday life and decision making…

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Appendix 1. Data

The database is an extension of the *Making of Global Finance* dataset (Flandreau and Zumer, 2004) to which 15 colonies of the British Empire (Canada, Cape colony, Ceylon, Egypt, India, Jamaica; Mauritius, Natal, New South Wales, New Zealand, Queensland, South Australia, Tasmania; Victoria, Western Australia) and one sovereign nation (the United States) have been added. *The Making of Global Finance* database is available at eh.net/databases/finance/. This posted version incorporates updates and minor corrections compared to the tables Flandreau and Zumer (2004) and should be preferred. For resemblances and differences with other datasets and primarily with the Ferguson and Schularick dataset, readers are referred to these authors.[86]

As in Flandreau and Zumer (2004), the database comprises four parts. Part I contains fiscal variables. Part II documents macroeconomics: population and trade. Part III contains financial series (bond yields and exchange rates). Finally, we report in part IV the political status of the various countries (sovereign, self-governing colony, Crown Colony, India, and British/Foreign).

PART I. Finance
General: Contemporary sources provide material on colonial finance. These include *Statesman's Yearbook*, *Burdett's Official Intelligence* (Stock Exchange Official Intelligence, annual), *Statistical Abstract for the Several Colonial and Other Possessions of the United Kingdom*. For Self-Governing Colonies we used *Burdett's* as it is the only source to provide simultaneously information on nominal debt, revenues, expenditures and "annual charge on debt" (nominal debt service). For Crown colonies, a shortcut is using Kesner's compilation, which relies on various editions of the *Parliamentary Papers* (Kesner 1981, pp. 18-31). These are later reconstructions. However, by randomly checking the Kesner series against annual sources such as *Statesman's Yearbook* or *Burdett's*, we found them in full agreement with one another. This does mean that our series reflect the flow of information as it was available "in real time" to investors. Of course for the same reason as indicated above, *Burdett's* was used to complement Kesner with data on interest service. All the above sources are in pound sterling.

Interest service
Sovereign countries:
- United States: *Statistical Abstract of the United States*;
- Other: see Flandreau and Zumer (2004).

Colonies:
- Self-Governing colonies and Crown colonies: *Burdett's Official Intelligence*;
- India, "Interest on Ordinary Debt": *National Accounts of Calcutta* ;
- Egypt: Saul (1997).

Default.
Argentina was considered in default from 1890 to 1892, Brazil in 1897, Greece from 1893 to 1897, Portugal from 1892 to 1901, and Spain from 1876 to 1881 (see Flandreau and Zumer (2004)).

Government revenue
Sovereign countries:
- United States: Mitchell (2003). We have noticed small discrepancies between Mitchell's series and those reported in *Statistical Abstract of the United States*;
- Other: See Flandreau and Zumer (2004).

Colonies:
- Self Governing: *Burdett's Official Intelligence*;
- Crown Colonies: Kesner (1981);
- India: *National Accounts of Calcutta*;
- Cape and Natal: *Statesman's Yearbook*;
- Egypt: *Corporation of Foreign Bondholders*, various issues.

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[86] . The colonial database used by Ferguson and Schularick is described in a 2003 draft "The Empire effect: The Determinants of Country Risk in the First Age of Globalization 1880-1913", "not to be quoted without the authors' permission, available at http://www.stern.nyu.edu/eco/wkpapers/workingpapers04/04-03Ferguson.pdf (at this date:11-01-08). Ferguson and Schularick say they use the *Investors Monthly Manual*, the *London Stock Exchange Weekly Intelligence*, the *Statesman's Yearbook*, the *Annual Reports of the Council of Foreign Bondholders*, various editions of *Fenn's Compendium*, and *the Statistical Abstracts for the Several Colonial and Other Possessions of the United Kingdom*, completed by a variety of additional individual sources. The dataset is available at www.niallferguson.org/publications.html (at this date: 11-01-08).

Deficits

Budget balances are computed as Revenue minus Expenditures.
Sources are the same as for Government revenue.

Public debts

Sovereign countries:
- United States: *Statistical Abstract of the United States*;
- Other: See Flandreau and Zumer (2004).

Colonies:
- Self Governing: *Burdett's Official Intelligence*;
- Crown Colonies: Kesner (1981);
- India: *National Accounts of Calcutta*; ("Ordinary Debt" + "Charge on irrigation and railways");
- Cape and Natal: *Statesman's Yearbook*;
- Egypt: Saul (1997)

Part II. Macroeconomic Series.

Exports

In millions of domestic currency (sterling for British colonies).

Sovereign countries:
- United States: Mitchell (2003);
- Other: See Flandreau and Zumer (2004) (corrected data).

Colonies:
- Self Governing: *Burdett's Official Intelligence*;
- Crown Colonies: Kesner (1981);
- India: *National Accounts of Calcutta*;
- Cape, Natal, and India: *Statesman's Yearbook;*
- Egypt: *Commerce Extérieur de l'Egypte*, Various issues.

Population.

In thousands.

Sovereign countries:
- United States: Mitchell (2003);
- Other: See Flandreau and Zumer (2004).

Colonies:
- Canada, Ceylon, India, New Zealand: Maddison (2003);
- Cape Jamaica Mauritius, Natal, New South Wales, Queensland, South Australia, Tasmania, Victoria, Western Australia : derived from *Statistical Abstract for Colonial Possessions*;
- Egypt: Mitchell (2003).

Part III. Financial series:

Yield on government bonds.

In %.

Yields are computed using the coupon/price formula, using quarterly data for sovereigns, US, colonies and Egypt. As indicated in Flandreau and Zumer (2004), conversion options warn against careless selection of benchmark securities. As a rule, we selected the security with the lowest coupon as it is the one for which the value of the conversion option is always lowest. We were also careful to avoid guaranteed securities when guaranteed and non-guaranteed securities co-existed. Securities from non-core countries (i.e. except Belgium, France, Germany, Holland, United Kingdom and the United States) are denominated in gold, franc, sterling, or gold.

Sovereign countries:
- United States: *Investor's Monthly Manual*: 1880-1894 : "4% 1877", 1895-1913 : "4% loan";
- Other: See Flandreau and Zumer (2004).

Colonies and Egypt:
Investor's Monthly Manual
Canada: 4% 1874-78 [1880-1883], 3.5% 1884 [1884-1891], 3% loan [1892-1913]
Cape Colony: 4.5% 1873-80 [1880-84], 4% 1881 [1884-1913]

Ceylon: 4% 1880 [1880-1889], 4% inscribed [1889-1913]
Egypt : 4% unified [1880-1913]
India: 4% [1880-81], 3.5% [1882-1913]
Jamaica: 4,5% 1879 [1880-1881], 4% 81-82 [1882-1889], 4% inscribed [1889-1914]
Mauritius: 4% cons deb. [1880-1888], 4% inscribed [1888-1913],
Natal: 4,5% 1876 [1880-82], 4%1882 [1883-1908], 4% cons. Inscr. [1909-13]
New South Wales: 4% ins. 1885, [1880-1913]
New Zealand: 4% inscribed 1929 [1880-1913]
Queensland: 4 % bonds [1880-1913]
South Australia: 4% 74-5-6-7-8 [1880-1913]
Tasmania: 4% 1878 [1880-82], 4% 81-83 [1883-1913],
Victoria: 4.5% 1878 [1880-82], 4% ins. 82-83 [1882-90], 4% 1885 [1891-1913]
Western Australia: 4.5% [1880-82], 4% 1881 [1883-1889], 4% inscribed 1934 [1890-1913]

Exchange Rates.

In domestic unit per French franc. For sovereign countries units are national units, as indicated in Flandreau and Zumer (2004) with the United States's currency being the US dollar. For British colonies the domestic unit is taken to be the pound sterling.

Sovereign countries:
- United States: Carter et al. (2006). *Historical Statistics of the United States: earliest time to the* present, series Ee618;
- Other: See Flandreau and Zumer (2004).

Colonies:
Flandreau and Zumer (2004).

Part IV. Colonial Status

Our database's sample includes:

Argentina, Austria-Hungary, Belgium, Brazil, Canada, Cape, Ceylon, Denmark, Egypt (1886-1913), France, Germany; Greece (1880-1898), India, Italy, Jamaica, Mauritius, Natal, Netherlands, New South Wales, New Zealand, Norway, Portugal, Queensland, South Australia, Spain, Sweden, Switzerland, Tasmania, Russia, United States, Victoria, Western Australia.

Ferguson and Schularick (2006) dataset (FS) sample includes:

Argentina, Australia, Austria, Belgium, Brazil, British Guyana, Bulgaria, Canada, Cape, Ceylon, Chile, China, Colombia, Denmark, Ecuador, Egypt, Gold Coast, Greece, Guatemala, Hong-Kong, Hungary, India, Italy, Jamaica, Japan, Liberia, Mauritius, Mexico, Montenegro, Natal, New South Wales, New Zealand, Nicaragua, Nigeria, Norway, Orange, Persia, Peru, Portugal, Queensland, Republic of South Africa, Rumania, Russia, Salvador, Serbia, Siam, Sierra Leone, South Australia, Spain, Straits Settlements, Sweden, Tasmania, Transvaal, Turkey, United States, Uruguay, Venezuela, Victoria, Western Australia.

(Note that this sample includes 59 countries instead of 57, as indicated in Ferguson and Schularick (2006)).

The following table summarizes these countries' colonial statutes.

Table A.1. Colonial status

Colonial status	Countries
Sovereign Countries	Argentina, Austria, Austria-Hungary, Belgium, Brazil, Bulgaria, Chile, China, Colombia, Denmark, Ecuador, France, Germany, Greece, Guatemala, Hungary, Italy, Japan, Liberia, Mexico, Montenegro, Netherlands, Nicaragua, Norway, Persia, Peru, Portugal, Rumania, Russia, Salvador, Serbia, Siam, Spain, Sweden, Switzerland, Turkey, United States, Uruguay, Venezuela (1880-1913), Egypt (1880-1882), Orange, Transvaal (1880-1900).
Self-Governing	Australia, Canada, Cape, New South Wales, New Zealand, Queensland, Republic of South Africa, South Australia, Tasmania, Victoria (1880-1913), Natal (1893-1913), Western Australia (1890-1913).
Crown Colonies	British Guyana, Ceylon, Gold Coast, Hong Kong, Jamaica, Mauritius, Nigeria, Sierra Leone, Straits Settlements (1880-1913), Natal (1880-1892), Western Australia (1880-1889), Orange, Transvaal (1901-1913)
Special statutes	Egypt (1883-1913)* India (1880-1913)**

* : Egypt's default took place in 1876. Following the 1880 settlement and political trouble, British navy intervened in 1882 (shelling of the Port of Alexandria). In 1883, the co-supervision of Egypt by France and Britain was ended to the benefit of Britain (Abolition of the "Dual Control" by a Decree of January 18th 1883). By 1885, de facto control of Egypt by Britain was established by the "London Convention", a financial scheme which secured a guaranteed international loan for the Egyptian government. This scheme put an end to financial uncertainty which followed political turmoil.

**: Supervised by India Office. British government guarantee for all Indian securities.

Appendix 2. Summary Statistics

The following tables show the variables' summary statistics for both AFRZ and FS datasets.

Table A.2.1: Summary statistics / AFRZ dataset

	Observations	Mean	St. Deviation	Minimum	Maximum
All countries					
- Spread	1028	1.35	1.62	-0.06	15.60
- Interest service/Revenues	1051	0.23	0.12	0.03	0.73
- Budget Balance/Revenues	1056	-0.03	0.18	-2.04	0.62
- Trade Openness	1050	1.10	1.10	0.02	7.64
Sovereigns					
- Spread	524	1.72	2.18	-0.06	15.60
- Interest service/Revenues	557	0.22	0.14	0.03	0.73
- Budget Balance/Revenues	558	-0.08	0.22	-2.04	0.36
- Trade Openness	553	0.67	0.57	0.07	2.90
Empire					
- Spread	504	0.97	0.32	-0.01	2.71
- Interest service/Revenues	494	0.24	0.10	0.06	0.52
- Budget Balance/Revenues	498	0.02	0.11	-0.60	0.62
- Trade Openness	497	1.58	1.33	0.02	7.64

Source: AFRZ dataset (see appendix 1). Variables are the same as in table 2.

Table A.2.2. Summary Statistics / FS dataset

	Observations	Mean	St. Deviation	Minimum	Maximum
All countries					
- Spread	1465	2.44	2.90	-0.06	19.34
- Nominal Debt/Revenues	1704	4.75	3.44	0.01	23.70
- Budget Balance/Revenues	1852	-0.11	0.38	-9.60	0.78
- Ln(Exports/Population)	1798	0.78	1.35	-3.00	4.20
Sovereigns					
- Spread	911	3.37	3.33	0.17	19.34
- Nominal Debt/Revenues	1043	4.56	3.52	0.05	23.70
- Budget Balance/Revenues	1098	-0.07	0.37	-9.60	0.78
- Ln(Exports/Population)	1119	0.31	1.10	-3.00	3.03
Empire					
- Spread	554	0.90	0.44	-0.06	3.44
- Nominal Debt/Revenues	661	5.04	3.29	0.01	20.48
- Budget Balance/Revenues	754	-0.16	0.39	-7.50	0.59
- Ln(Exports/Population)	679	1.56	1.38	-1.83	4.20

Source: Ferguson and Schularick (2006) dataset (FS). Variables are the same as in table 2. Note that there are small differences between the summary statistics in this table and those in Ferguson and Schularick (2006), table 2, p. 294.

Appendix 3.

In this appendix, we determine the precise incidence that the specification adopted by Ferguson and Schularick is bound to produce the kind of output they report. That is, we are able to explain the reasons for the results in Table 2. As the reader will remember, two features stood out. First, F-S estimates of the incidence of fundamentals on borrowing costs are smaller (in absolute value) than F-Z ones. Second, the Empire effect measured à la F-S is similar to that derived from the D-H specification.

a) F-S under-estimate true effect of fundamentals

F-S estimators (which we refer to as $\hat{\beta}_{FERG}$) are calculated using model:

$$s_{it} = x_{it} \cdot \beta + \varphi_i + \varepsilon_{it} \text{ for all countries i, colonies and sovereigns} \tag{A.1}$$

When the true model is:

$$\begin{cases} s_{it} = x_{it} \cdot \beta + \phi_i + \varepsilon_{it}, & \text{if i is a sovereign} \\ s_{it} = \phi_i + \varepsilon_{it}, & \text{if i is a colony} \end{cases} \tag{A.2}$$

Correct estimation of β, or $\hat{\beta}_{TRUE}$, would be obtained by estimating model (A.2) and this would provide an unbiased estimator of β. But this is not what Ferguson and Schularick do, causing a number of problems.

The first property of $\hat{\beta}_{FERG}$ that we establish is the following:

$$0 \leq \left| E\left(\hat{\beta}_{FERG}\right) \right| < \left| E\left(\hat{\beta}_{TRUE}\right) \right| = |\beta| \tag{A.3}$$

That is $\hat{\beta}_{FERG}$ systematically underestimates true values. Without loss of generality, we establish below this property in the simple case where the spread of sovereign countries is determined by one exogenous fundamental only although the property generalizes to multivariate frameworks provided that we are looking at an effect that is non zero in the case of colonies (as is the case for default and memory of default, which never occurred within the Empire).

Let's call *k* the number of sovereign countries in a sample of *n* countries. For simplicity we write (A.1) in difference from the mean (thus taking care of fixed effects). We see that Ferguson and Schularick estimate:

$$s_{it} - \overline{s}_i = (x_{it} - \overline{x}_i) \cdot \beta + \varepsilon_{it} \tag{A.4}$$

When the true model is:

$$\begin{cases} s_{it} - \overline{s}_i = (x_{it} - \overline{x}_i) \cdot \beta + \varepsilon_{it}, & \text{if i is a sovereign} \\ s_{it} - \overline{s}_i = + \varepsilon_{it}, & \text{if i is a colony} \end{cases} \tag{A.5}$$

We have:

$$\hat{\beta}_{TRUE} = \frac{\sum\limits_{i=1}^{k}\sum\limits_{t=1}^{T}(x_{it} - \overline{x}_i)\cdot(s_{it} - \overline{s}_i)}{\sum\limits_{i=1}^{k}\sum\limits_{t=1}^{T}(x_{it} - \overline{x}_i)^2} \qquad (A.6)$$

But Ferguson and Schularick compute instead:

$$\hat{\beta}_{FERG} = \frac{\sum\limits_{i=1}^{n}\sum\limits_{t=1}^{T}(x_{it} - \overline{x}_i)\cdot(s_{it} - \overline{s}_i)}{\sum\limits_{i=1}^{n}\sum\limits_{t=1}^{T}(x_{it} - \overline{x}_i)^2} \qquad (A.7)$$

Substituting $s_{it} - \overline{s}_i = (x_{it} - \overline{x}_i)\cdot\beta + \varepsilon_{it}$ for all non-colonies and $s_{it} - \overline{s}_i = \varepsilon_{it}$ for all colonies into the previous equation and taking expectations, we get:

$$E\left(\hat{\beta}_{FERG}\right) = \frac{\sum\limits_{i=1}^{k}\sum\limits_{t=1}^{T}(x_{it} - \overline{x}_i)^2 \cdot \beta}{\sum\limits_{i=1}^{n}\sum\limits_{t=1}^{T}(x_{it} - \overline{x}_i)^2} = \beta \cdot (1 - \frac{\sum\limits_{i=k+1}^{n}\sum\limits_{t=1}^{T}(x_{it} - \overline{x}_i)^2}{\sum\limits_{i=1}^{n}\sum\limits_{t=1}^{T}(x_{it} - \overline{x}_i)^2}) \qquad (A.8)$$

But since by definition:

$$0 \leq \frac{\sum\limits_{i=k+1}^{n}\sum\limits_{t=1}^{T}(x_{it} - \overline{x}_i)^2}{\sum\limits_{i=1}^{n}\sum\limits_{t=1}^{T}(x_{it} - \overline{x}_i)^2} \leq 1 \qquad (A.9)$$

We then have equation (A.3).

b) F-S converges towards D-H estimates

An interesting property that we establish now is that the Empire effect measured by Ferguson and Schularik converges towards what would obtain from working with the Davis and Huttenback specification when the number of colonies in the sample is large enough. In other words, the more colonies you include in F-S regressions and the closer you get to the D-H output.

Second, when one includes a very large number of colonies (i.e. when *n-k*, the number of colonies in the sample converges towards infinity), Ferguson and Schularick's estimated incidence of fundamental variables converges towards zero. Formally:

$$\lim E\left(\hat{\beta}_{FERG}\right) \xrightarrow{n-k\to\infty} 0 \qquad (A.10)$$

This result follows naturally from (A.8) when we assume that the number of colonies (*n-k*) becomes very large. The intuition is straightforward. Because it is computed on the basis of

both sovereign countries (for which fundamentals matter) and colonies (for which they don't), $\hat{\beta}_{FERG}$ is effectively a weighted average of the true β and 0, thus underestimating the size of β, as we saw. But then, the weight of 0 increases with the number of colonies in the regression for a given number of sovereigns. When there are enough colonies (when sovereign countries represent a negligible share of the population) $\hat{\beta}_{FERG}$ converges towards zero.

To see why the Empire effect measured through the F-S procedure is essentially the same as from the D-H procedure in Table 3, substitute (A.10) in (A.1). The model estimated by Ferguson and Schularick converges asymptotically towards:

$$s_{it} = \phi_i + \varepsilon_{it} \tag{A.11}$$

This implies that, as *n-k* becomes large, the estimated fixed effects from (9) must converge towards individual borrowers' average spreads:

$$\lim E\left(\hat{\varphi}_i\right) \xrightarrow{n-k \to \infty} \overline{s}_i \tag{A.12}$$

Therefore, the second stage regression in Ferguson and Schularick is equivalent to regressing individual average spreads on a constant and a colonial dummy, or:

$$\overline{s}_i = \theta + \gamma \cdot \theta_{col} + \eta_i \tag{A.13}$$

Where we recognize the Davis and Huttenback regression (1) in the text (except that here, all categories of colonies are pooled). The Ferguson and Schularick method thus identifies as the "Empire effect" $\hat{\gamma}$ the difference between the average yield of colonies and the average yield of sovereigns or D-H "spread of spreads".