Institutional Explanations of Economic Development: the Role of Precious Metals

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Summary

Recent research has emphasized the influence of colonization on the institutional development and economic performance in former European colonies. Where European colonizers settled, they replicated the investment-conducive institutions found at home. It has been argued that a harsh disease environment and a highly urbanized native population worked against colonization. We show evidence for another significant element explaining the endogenous character of colonization strategies and the formation of institutions. We find the presence of precious metals, gold and silver, to imply an increase in settlements, and an improvement in institutional quality, even when correcting for settlements. Highly valued gold and silver reserves attracted Europeans in large numbers and resulted in an institutional upgrade of mineral-rich areas.

Keywords: Precious metals, Institutions, Economic development

JEL Classification: O13, O17, Q33

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1. INTRODUCTION

A number of recent studies has placed a particular emphasis on the role of institutions in explaining the large differences in income per capita observed across the world (see e.g. Acemoglu et. al 2001, 2002, Knack and Keefer 1995, Mauro 1995, 1998). An average citizen in the U.S. receives an annual income more than 20 times larger the one of an average civilian in Ethiopia or in Sri Lanka. "Good" institutions create an environment conducive to investment in physical and human capital, and contribute therefore to substantial welfare achievement. On the other hand, "bad" institutions discourage individuals from undertaking investments by creating uncertainty and low expected returns.

The distinction between "good" and "bad" institutions for long-term development is, however, not obvious. To some extent, 'institutions' is so vague as a notion that it can include almost everything that affects long-term income. It can comprise the extent of democratic liberties, the degree of corruption, the level of political stability, as well as all kinds of regulations that encourage (or discourage) investment, schooling or trade. A major institutional feature is the system that governs how prices are determined or how the market for production and inputs is regulated.

In this paper, we capture institutional differences among countries by focusing on the variation in the extent of property rights. The importance of property rights in encouraging investment, entrepreneurship and income growth has long been established in the literature (Hayeck 1960, North 1991). In this context, good institutions relate to secure and effective rights of private property, that ensure secure investing opportunities (and thus returns) to a broad section of the society. On the other side, bad institutions imply a large risk of expropriation for investors, a limited allocation of property rights within the local population, as well as severe difficulties in enforcing them. In that respect, we largely follow Acemoglu et al. (2001, 2002)

that also emphasize the importance of property rights for investments, industrialization and long-term development.

Acemoglu *et al*. (2001, 2002) argue that institutional development outside Europe was influenced to a large extent by the colonization policies of the European powers. The colonizing powers developed two different strategies that created an institutional divergence in the colonies. In some colonies, Europeans settled in large numbers, importing the institutions prevailing at their countries of origin. They tried to replicate the institutional framework of their metropolises, largely based on the protection of private property rights. In the other colonies, Europeans settled in small numbers, and mainly limited the institutional set up to an efficient administration for extracting resources from the local colony economies. Acemoglu *et al*. find two explanations for the two different settlement strategies of the colonizers. First, they claim that the disease environment played an important role (see Acemoglu et al. 2001). Secondly, they argue that sparsely populated (and urbanized) regions enabled Europeans to settle in larger numbers compared to densely-populated areas (Acemoglu et al. 2002).

We build on the same framework and extend it, analyzing another determinant of European settlements. The resource affluence of the colonizing area also determined the settlement strategy of colonizers. We argue that the variability of endowments in the precious metals of gold and silver across colonized areas is likely to have affected the settling planning of Europeans. Precious metals were to a large extent the main minerals reaching Europe from the New World countries. Gold and silver were both exported to meet demand by the elites of the European societies. The prestigious character of these precious metals of relative high value and low labor-intensive production established their producing regions as prominent settling destinations among colonizers. In the eyes of potential settlers, the sparkle of gold and silver made their originating countries gleam as well. Figure 1 illustrates the variability in the production of precious metals outside Europe in 1900

Our analysis is of particular interest in relation to the recently invigorated interest on the impact of resource abundance on welfare (see Atkinson and Hamilton 2003, Bulte et al. 2005, Neumayer 2004, Papyrakis and Gerlagh 2004). A large body of empirical and theoretical work (e.g. Auty 1994, Gylfason 2001, Leite and Weidmann 1999, Sachs sand Warner 1995, 2001, Torvik 2001, 2002) establishes a negative link between resource affluence and economic performance; a phenomenon often referred to as the resource curse hypothesis. Other studies either cast doubt on these findings criticizing the assumptions adopted, or the statistical estimations, or they accentuate the beneficial role of natural resources on development in the past (see Davis 1995, Manzano and Rigobon 2003, Stijns 2005). We argue that in colonial history, mineral endowments supported welfare improvements through attracting colonizers and stimulating the set up of good market institutions. The impact of resources on colonization strategies is still reflected in the income distribution observed nowadays across the world

Section 2 summarizes the various hypotheses on the causes of colonization strategies and it tests these empirically. Specifically it analyzes the significance of precious metals as an additional explanatory variable for both settlement behavior and institutional development. Section 3 briefly extends the analysis to agricultural commodities. Section 4 concludes.

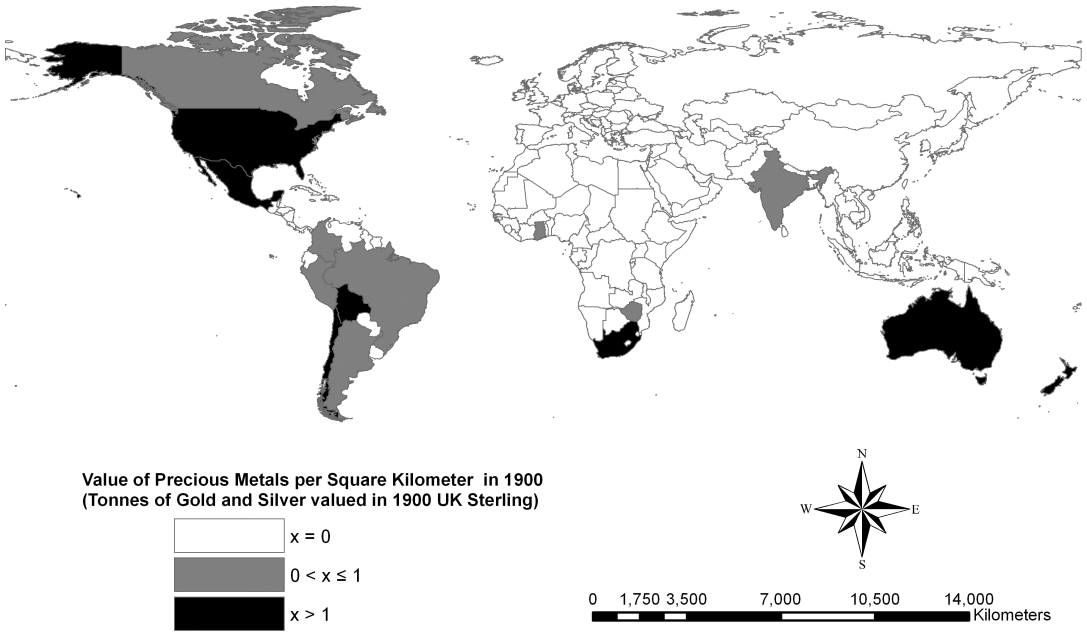

FIGURE 1. *Precious Metals in Colonized Countries*

2. PATTERNS OF COLONIZATION

2.1. The Mortality Hypothesis

The Mortality Hypothesis presupposes a negative relationship between European mortality rates in colonized areas and European settlements, and a positive relation of the latter with the establishment of a pro-growth institutional framework. According to this hypothesis, Europeans settled in small numbers in regions of higher mortality rates, mainly caused by malaria and yellow fever (see Curtin 1964, 1998). On the other side, Europeans settled in larger numbers in areas where they faced a less harsh disease environment, outnumbering in some occasions the indigenous population. In turn, the magnitude of the settlers' influx to the New World countries was a major determinant of the institutional policies established across regions. Europeans attempted to reproduce a European structural organization in the newly-colonized areas, and succeeded to replicate the home institutions when settling in large numbers (Denoon 1983). In

that respect, institutions of extensive and well-guarded property rights were broadly established to accommodate the demands of colonizers to imitate the capitalist structure of their societies (e.g. La Porta et al. 1998, 1999).

Acemoglu *et al*. (2001) establish the link between the disease environment of the colonized world and the following institutional development, using data on the mortality rates of soldiers, bishops and sailors between the 17th and 19th centuries. They argue that local diseases were often fatal to many European settlers, while the indigenous populations had developed immunity towards them. Awareness, back in Europe, of this disease environment influenced to a large extent the settlement decisions of the colonizing powers. In that respect, mortality rates determined consecutively settlement policies, institutional development and economic affluence.

2.2. The Urbanization Hypothesis

The Urbanization Hypothesis stresses the importance of urbanization patterns across different parts of the colonized world in shaping the immigration patterns of European settlers (for a discussion on the issue see Sokoloff and Engerman 2000 and Acemoglu et al. 2002). Europeans had a preference for sparsely populated areas, where they could settle in large numbers without engaging into frequent conflicts with the native populations. To the extent that urbanization reflects the level of development, highly urbanized local societies corresponded to affluent and well-structured social structures, which were more likely to rebel against the imposition of European law and order rather than the less organized sparsely populated areas. Densely populated areas were thus less desired for Europeans emigration, and when Europeans moved to these areas, they preferred to settle in small numbers and to set up institutions for resource wealth extraction, rather than to imitate the pro-growth institutional framework of their home countries. The extractive institutions were framed to force the local labor force to work in plantations, and to reap a share of local income through taxation. In the densely and highly-urbanized areas, the Europeans pursued to establish an administration based on the concentration

of power in the hands of a few settlers, which could create income through oppression (see Dunn 1972).

Acemoglu et al. (2002) provide econometric evidence on the linkage between urbanization patterns and the development of subsequent institutions across the colonized world using population density data and numbers of population centers consisting of more than 5000 people. They claim that countries more prosperous and densely populated in 1500 became disadvantaged in terms of their institutional inheritance by European colonizers. Affluent densely-populated regions attracted few European settlers who established extractive institutions. Ultimately, this colonization pattern resulted in a reversal of fortune.

2.3. The Precious Metals Hypothesis

According to the Precious-Metals Hypothesis, the mineral endowment of colonies influenced to a large extent the colonizing policies of Europeans. We focus on gold and silver because of their relative high value per weight, but also due to the fact that these minerals were the main exporting minerals to the colonizing powers. Furthermore, most of non-ferrous mineral production (copper, zinc, aluminium, chromium, lead etc) was either of negligible amount or non-existent during the colonization process of most countries. Our analysis bears resemblance to the approach by Easterly and Levine (2003) that also focus on the impact of primary commodities on institutions, although they use recent dummy variables rather than detailed historical data and they do not relate their findings to the colonization strategies of Europeans. Furthermore, they do not discern between agricultural commodities and minerals and furthermore they exclude gold production from their dummy index, while we specifically focus on gold as probably the most valuable mineral at the time of colonization.

The precious-metals hypothesis rests on the following premises. First, the New World countries discovered outside Europe provided the old continent with substantial amounts of gold and silver. Those newly-discovered countries were not homogeneous in terms of their resource

endowment. Some countries had a larger potential as producers of precious metals, a distinction the importing European countries were aware of. Second, the extent of resource endowment influenced the settlement decision of Europeans. Gold and silver –high-valued commodities exported to the elites of the European societies, that were capable to afford them– added a prestigious reputation to their producing areas. The lucrative nature of those metals was reflected enticingly to the settlement decisions of Europeans. Third, the settlement decision in a specific area substantially influenced the institutional framework established. When European settled in large numbers, they replicated the institutions found in their originating countries that protected to a large extent property rights for a broad section of the society. If Europeans settled in smaller numbers, extractive institutions were set up, that granted safe property rights to the ruling elite rather then to the people. This third premise is shared with the Mortality and Urbanization hypothesis. Fourth, in addition to the settlement decision, precious metals also affected the institutional set up more directly. Settlers in a resource-rich environment demanded better institutions than settlers in a resource-poor environment. Fifth, institutions of safe and extensive property rights support the process of economic development and, thus, facilitate the attainment of a higher level of income per capita. This fifth premise is also shared with the other hypotheses.

Table 1 presents two-stage least-squares (2SLS) estimates of causes of recent economic prosperity in the colonized countries, as captured by the log of GDP in 1995 (data provided by the World Bank 1999). Panel A shows that institutions have a large and very significant effect on the level of economic affluence across the colonized world. Following Acemoglu et al. (2001) we use an index of protection against expropriation risk averaged over 1985-1995 (*Institutions*

85-95) varying in the 0 to 10 range, where higher values correspond to better enforcement of property rights.[1]

Panel B of Table 1 exposes the endogenous character of institutions as dependent on factors related to European colonialism. To test the Mortality Hypothesis, we use the death rate among 1000 soldiers for the first year in the 19th century for which data are available (*Log Settler Mortality*), as in Acemoglu et al. (2001). To test the Urbanization Hypothesis, we use the percentage of indigenous population living in urban centers of at least 5000 inhabitants in 1500 (*Urbanization 1500*), as in Acemoglu et al. (2002). For the Precious-Metals Hypothesis, new in this paper, we use the value of gold and silver per square kilometer in 1900 (*Gold and Silver 1900*) as a measure of resource affluence (data on prices and quantities are provided by Schmitz 1979). For all three independent variables, we also tested the impact on income through other channels than through institutions, by running a regression with income dependent on institutions and settlements, and *Log Settler Mortality*, *Urbanization 1500*, and *Gold and Silver 1900*. None of these variables has explanatory power, so that their only impact on income goes indirectly through their effect on settlements and institutions. This justifies the use of these variables as valid instruments.

As depicted in Panel A of Table 1, there is a strong positive correlation between institutions and income per capita. This finding has been largely exposed also in Acemoglu et al. (2001, 2002). What is more of interest, though, is the endogenous character of the institutional development outside Europe. Acemoglu *et al*. (2001) accentuate the importance of the disease environment in attracting settlers and institutions across the globe (i.e. the Mortality Rate Hypothesis). Similarly, Acemoglu *et al*. (2002) emphasize the influence of urbanization and population density on shaping colonization strategies and intuitional development (i.e. the

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[1] Acemoglu et al. (2001) comment on how institutions persist over time. Their institutional measure at the end of the 20th century is strongly correlated with its values at the beginning of the century.

Urbanization Hypothesis). The focal point of our analysis lies in a third factor, the role of precious metals on the flow of settlers and the corresponding import of their institutional background. In Panel B, columns (1)-(3), we confirm the negative role urbanization patterns and the disease environment played in the institutional development of the colonized world. Column (3), however, casts some doubt on the role of early urbanization in shaping institutions when controlling for the disease environment. Subsequently, columns (4)-(6) add precious metals to the list of explanatory variables and find a strongly significant contribution thereof to the establishment of income-supporting institutions. The precious metals hypothesis is robust when tested jointly with the urbanization and settler mortality hypotheses. When testing all hypotheses simultaneously (column (6)), we find the precious metals and settler mortality hypotheses to complement each other in explaining institutional divergence across the world, while urbanization seems to bear a lower explanatory power.

In column (7) we further analyze the role of precious metals and settler mortality in shaping institutions, when we control for the fraction of the population of European descent in 1900 (*Settlements 190*0, as in Acemoglu *et al*. 2001). *Urbanization 1500* turns out to be insignificant and we drop it from the regression. An additional benefit is that we can use a much larger sample. Both coefficients for *Precious Metals* and *Log Settler Mortality* fall, compared to column (5), but remain highly significant. This suggests that a large part of the impact of precious metals and the disease environment on institutions went through influencing colonization strategies, but that both variables also had a more direct impact on institutional shaping.

Whereas the first table analyzed the effect of precious metals and a less urbanized and milder disease environment on institutions, in Table 2, we go back one step, to the settlement decisions, and examine the variables effects on colonization strategies, and subsequently on present-day income. Table 2 presents two-stage least-squares (2SLS) estimates of recent welfare levels in

former colonies, using the settlements variable as an intermediate channel. The settlement proxy is positively correlated with the institutional measure at the 1% level of significance. Panel A of Table 2 reveals that, indeed, areas where Europeans settled in large numbers managed to achieve higher levels of economic prosperity through the course of time. Panel B examines the endogenous character of settlement decisions. Columns (8)-(10) reveal that a high urbanization level and a harsh disease environment discouraged European migration. Both variables are also significant when tested jointly (column (10)). In columns (11)-(13), we add precious metals to the list of independent variables and we find strong evidence for a tendency of European settlers to migrate to regions affluent in precious metals. The last column (13) reveals that, when testing jointly for all three hypotheses, precious metals were a more significant cause of settlements than the disease environment.

To sum up, our findings extend the analysis by Acemoglu *et al.* (2001, 2002) on the link between settlements, institutions and welfare in the following manner. When examining all hypotheses jointly (column entries (6) and (13)), we find indigenous urbanization patterns to negatively and significantly affect the establishment of European settlements, but to impose a rather limited effect on institutional development. Inversely, we find settler mortality to be of limited power in explaining settlements policies, while being negatively and significantly correlated with institutional quality. Precious metals, at the same time, had a long-lasting effect on welfare both through increasing the number of European settlements and by leading to improved institutions, consecutively.

To study whether, indeed, precious metals have a particular and positive effect on present-day income, we analyze the statistical association between current production levels of various minerals and present-day income levels when examined jointly with gold production (*Gold 1995*). We obtain data on the value of several minerals per square kilometer in 1995 by the 1995 Commodity Yearbook of the United Nations Conference on Trade and Development (United

Nations 1995). In Table 3 we present some tentative results using disaggregated data for mineral production. Our results must be treated, tough, with caution, since disaggregated mineral data do not exist for a large sample of countries. Our results confirm that countries rich in gold tend to be relatively more prosperous nowadays, perhaps reflecting the long-term effect implied by the precious metals hypothesis. This tendency holds when controlling for the production levels of other minerals. On the other hand, all other minerals have an insignificant effect on income levels, and some minerals (zinc, bauxite, copper, lead and nickel) even seem to impose a contracting impact on income. The special character of gold is reflected on its strong association with institutional quality, as depicted in Table 4, column (25). For a large part, the correlation between gold and income goes through the early development of institutions, indeed, as column (26) shows. When controlling for *Gold and Silver 1900*, the coefficient level of current gold production and its significance drop substantially. Also, when including the institutional proxy in the regressions of Table 3, the coefficient of gold production typically halves. For as much as gold is concerned, there is no evidence of a reversal of the resource fortune.

TABLE 1. *GDP per capita and Institutions.*

Panel A: Dependent variable: log GDP per capita in 1995 (Two-Stage Least Squares)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	3.37	2.04	4.49	4.35	2.73	4.53	2.59
Institutions 85-95	0.74***	0.92***	0.58***	0.60***	0.82***	0.57***	0.84***
(1.47, 1.45, 1.47)	(0.16)	(0.17)	(0.07)	(0.08)	(0.13)	(0.07)	(0.12)
R^2 adjusted	0.24	0.36	0.52	0.43	0.41	0.53	0.45
N	38	38	38	38	64	38	63
Panel B: Dependent variable: *Institutions 85-95* (First Stage Regressions)							
Constant	6.30	9.37	12.11	7.28	8.64	11.21	7.76
Gold and Silver 1900				0.55***	0.43***	0.25*	0.23***
(0.98, 1.23, 0.99)				(0.10)	(0.12)	(0.15)	(0.08)
Urbanization 1500	–0.11**		–0.04	–0.10***		–0.05	
(5.10)	(0.04)		(0.03)	(0.04)		(0.03)	
Log Settler Mortality		–0.61***	–1.21***		–0.49***	–1.01***	–0.35**
(1.25, 1.25, 1.24)		(0.15)	(0.21)		(0.15)	(0.25)	(0.18)
Settlements 1900							1.79***
(0.26)							(0.65)
R^2 adjusted	0.25	0.26	0.50	0.32	0.32	0.53	0.36
N	38	64	38	38	64	38	63

Note: Standard deviations for independent variables in parentheses, based on the sample N=64 (N=38 and 63 when a second and third standard deviation is mentioned); robust standard errors for coefficients in parentheses. Superscripts *, **, *** correspond to a 10, 5 and 1% level of significance.

TABLE 2. *GDP per capita and Settlements.*

Panel A: Dependent variable: log GDP per capita in 1995 (Two-Stage Least Squares)	(8)	(9)	(10)	(11)	(12)	(13)
Constant	7.85	7.24	7.71	7.90	7.41	7.85
Settlements 1900 (0.26, 0.29)	2.66*** (0.57)	4.96*** (1.20)	3.23*** (0.88)	2.47*** (0.32)	3.91*** (0.80)	2.68*** (0.41)
R^2 adjusted	0.25	0.34	0.37	0.36	0.39	0.40
N	38	63	38	38	63	38
Panel B: Dependent variable: *Settlements 1900* (First Stage Regressions)						
Constant	0.44	9.37	0.97	0.36	0.50	0.60
Gold and Silver 1900 (0.99, 1.23)				0.12*** (0.03)	0.11*** (0.04)	0.10*** (0.03)
Urbanization 1500 (5.10)	–0.03** (0.01)		–0.02*** (0.01)	–0.03*** (0.01)		–0.03*** (0.01)
Log Settler Mortality (1.25, 1.24)		–0.11*** (0.03)	–0.14** (0.07)		–0.08*** (0.03)	–0.06 (0.07)
R^2 adjusted	0.12	0.29	0.37	0.51	0.42	0.51
N	38	63	38	38	63	38

Note: Standard deviations for independent variables in parentheses, based on the sample N=63 (N=38 when a second standard deviation is mentioned); robust standard errors for coefficients in parentheses. Superscripts *, **, *** correspond to a 10, 5 and 1% level of significance.

Table 3. *Current Resource Abundance and Income per Capita*

Dependent variable: log GDP per capita in 1995	(14)	Oil 95 (15)	Zinc 95 (16)	Coal 95 (17)	Lignite 95 (18)	Bauxite 95 (19)
Constant	7.63	7.92	7.90	7.73	7.96	8.07
Gold 1995 (0.21, 0.22, 0.22, 0.23, 0.25, 0.27)	2.75*** (0.76)	2.60*** (0.77)	3.14*** (0.77)	3.09*** (0.86)	2.86 (2.00)	1.74 (1.82)
Alternative Fuel or Mineral 1995 (–, 5.44, 0.15, 1.15, 0.04, 0.48)		0.02 (0.03)	–0.72 (1.14)	0.12 (0.18)	8.05 (7.59)	–0.27 (0.47)
R^2 adjusted	0.28	0.26	0.36	0.31	0.06	–0.04
N	42	24	21	21	7	10

Note: Standard deviations for independent variables in parentheses, based on the sample of each regression; robust standard errors for coefficients in parentheses. Superscripts *, **, *** correspond to a 10, 5 and 1% level of significance.

Table 3 *cntd. Current Resource Abundance and Income per Capita*

Dependent variable: log GDP per capita in 1995	Copper 95 (20)	Iron 95 (21)	Lead 95 (22)	Nickel 95 (23)	Phosphate 95 (24)
Constant	7.80	7.91	7.96	8.16	7.69
Gold 1995 (0.17, 0.26, 0.22, 0.23, 0.24)	3.30** (1.48)	1.84** (0.81)	2.87*** (0.78)	2.19*** (0.77)	2.96** (1.19)
Alternative Fuel or Mineral 1995 (0.30, 0.20, 0.05, 0.10, 0.08)	–0.46 (0.92)	1.35 (0.95)	–0.75 (3.73)	–0.19 (0.35)	1.23 (3.54)
R^2 adjusted	0.16	0.20	0.31	0.19	0.25
N	19	22	21	18	13

Note: Standard deviations for independent variables in parentheses, based on the sample of each regression; robust standard errors for coefficients in parentheses. Superscripts *, **, *** correspond to a 10, 5 and 1% level of significance.

Table 4. *Current Resource Abundance and Institutions*

Institutions85-95	(25)	(26)
Constant	6.07	6.00
Gold 1995	3.21**	1.83*
(0.21)	(1.35)	(1.01)
Gold and Silver 1900 (*)		0.55***
		(0.15)
R^2 adjusted	0.17	0.33
N	42	42

Note: Standard deviations for independent variables in parentheses, based on the sample of each regression; robust standard errors for coefficients in parentheses. Superscripts *, **, *** correspond to a 10, 5 and 1% level of significance.

3. From Precious Metals to Resource Abundance

The analysis above focuses on the beneficial role of precious metals through attracting European settlers and improving institutions. In this section, we briefly examine whether we can extend the precious metals hypothesis to agricultural productivity as another natural resource highly valued at the time of colonization. In the eyes of potential European settlers, the colonized areas were perceived as regions producing precious metals but also agricultural commodities (mainly coffee, tea, cocoa and sugar). These were the main products reaching Europe from the New World countries. In many colonies, large plantations were established where production was feasible. On average, countries with a high agricultural potential could sustain and feed a much larger native population, and as such they provided a large native labor force for plantations. At the same time, however, these countries were more densely

populated and urbanized discouraging Europeans to settle in large numbers, but rather establish a small local elite that could regulate agricultural exploitation.

In Table 5, columns (27) and (28), we replicate columns (4) and (5) of Table 1, incorporating in Panel B the value of the production of coffee, sugar, cocoa and tea per square kilometer in 1970 (*Plantations 1970*) as a proxy for the agricultural potential across the colonized world. We focus on the production of coffee, sugar, cocoa and tea, since these were the major exporting agricultural commodities of the New World to Europe at the time. Although other secondary agricultural products may have been exported to Europe, we believe that focusing on these four commodities depicts in a pretty accurate manner the agricultural potential of an area and the importance of plantations as an economic activity. We acknowledge that a measure of earlier date would be preferable, but extensive disaggregated data on commodity volumes and prices do not exist for earlier periods (see United Nations Conference on Trade and Development (UNCTAD), Commodity Yearbook 2000). Furthermore, the potential to produce these agricultural commodities during colonization should be still largely captured by our proxy, to the extent that climatic and hydro-geologic conditions that largely determine such a capacity are persistent. Similarly, Easterly and Levine (2003) used dummy variables for primary commodities reflecting whether a country produced a commodity or not in 1998-1999, assuming that production patterns persist over time.

Similarly to precious metals, we find agricultural production to affect positively the establishment of good institutions (as in Easterly and Levine 2003). In that respect, our findings contradict the "crops hypothesis" by Engerman and Sokoloff (1997) and Sokoloff and Engerman (2000) that argue in favor of a negative impact of large-scale plantations on

institutional quality. The coefficients for the other variables are not affected by the inclusion of agricultural potential.

Subsequently, in columns (29) and (30), we replicate columns (11) and (12) of Table 2, adding agricultural productivity as an additional regressor to examine whether the positive association between institutions and plantations can be attributed to European settlements. Or in other words, is it the case that areas of high agricultural potential established better institutions by attracting relatively more European settlers? Panel A reaffirms the beneficial role of settlements on welfare levels, but in Panel B, we find that agricultural productivity discouraged immigration contrary to the abundance of precious metals. The relation even holds after controlling for the possibility that areas with a high agricultural potential could sustain high levels of native population discouraging Europeans immigration (in order to avoid frequent frictions with the indigenous people). This finding is consistent with Sokoloff and Engerman's (2000) argument that privileged elites in areas of plantations often imposed institutions discouraging European immigration to preserve their exclusive position. To summarize, colonies rich in agricultural products did not attract many European settlers, but nonetheless, the presence of plantations is positively correlated to better institutions.

TABLE 5. *GDP per capita, Institutions and Settlements (Precious Metals and Plantations).*

Panel A: Dependent variable: log GDP per capita in 1995 (Two-Stage Least Squares)	(27)	(28)	(29)	(30)
Constant	4.08	2.65	7.99	7.46
Institutions 85-95 (1.47, 1.45)	0.64*** (5.68)	0.83*** (0.13)		
Settlements 1900 (0.25, 0.29)			2.08*** (0.36)	3.58*** (0.66)
R^2 adjusted	0.46	0.42	0.30	0.37
N	38	64	38	63
Panel B: Dependent variable: (First Stage Regressions)	*Institutions 85-95*		*Settlements 1900*	
Constant	7.18	8.44	0.39	0.55
Gold and Silver 1900 (0.95, 1.23, 0.99)	0.57*** (0.11)	0.45*** (0.13)	0.12*** (0.03)	0.10** (0.04)
Plantations 1970 (0.73, 0.54, 0.43)	0.39** (0.16)	0.34** (0.17)	–0.09*** (–0.03)	–0.08** (0.03)
Urbanization 1500 (5.10)	–0.10** (0.04)		–0.03*** (–0.01)	
Log Settler Mortality (1.24)		–0.45*** (0.16)		–0.09*** (0.03)
R^2 adjusted	0.32	0.32	0.52	0.43
N	38	64	38	63

Note: Standard deviations for independent variables in parentheses, based on the sample N=64 (N=38 when a second standard deviation is mentioned); robust standard errors for coefficients in parentheses. Superscripts *, **, *** correspond to a 10, 5 and 1% level of significance.

4. CONCLUSIONS

Many scholars have been concerned with explaining the divergent development paths of non-European economies after the era of European colonization. Recently, much attention has been given to the institutional aspect of economic development and its origin in European immigration. Europeans immigrated and imported their welfare-supporting institutions in regions of scarce indigenous populations and of mild disease environment. In this paper, we highlight another factor that significantly describes the endogenous character of colonization strategies, namely the endowments in precious metals. We find that regions rich in highly-valued gold and silver were prominent settling destinations and in addition thereto, that these areas were fortunate enough to inherit better institutions. This finding suggests that, even if nowadays minerals have a contracting growth impact as suggested by the "resource curse hypothesis", in the past natural resources have been beneficial for welfare.

We consider several extensions of our analysis of interest for studying the institutional dimensions of economic development and its relationship to European immigration. The hypothesis that European immigration resulted in an investment-conducive institutional framework should be tested, for instance, for a more extensive array of institutional proxies. Additionally, we want to search for other intermediate variables as determinants of long-term welfare, and see whether these are linked to colonization policies. Thirdly, although the focal point of the paper lies in the impact of precious metals on colonization policies and institutions, we believe the association between agricultural production and institutional quality deserves a further investigation. Although beyond the scope of our analysis at this stage, we believe it is of interest to examine in more detail the mechanisms through which

agricultural potential resulted in good institutions. Specifically, we would like to further investigate the relation between resource affluence, population density, schooling, and institutional quality.

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