Copper and Foreign Investment: The development of the mining industry in Cyprus during the great depression

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Abstract:
This paper evaluates the impact of the rapid growth of mining on the Cypriot economy during the period 1921-1938, with special focus on the expansion of copper sulphate mining. During this period the industry was transformed by companies such as the Cyprus Mining Corporation (CMC) and this affected the whole economy and society. The island was for the first time inundated with substantial foreign direct investment, which encouraged technological adaptation and altered labour relations; as such there has been a debate on how beneficial was mining for the economy at that time. Using substantial primary data we estimated output (GDP share), employment and productivity estimates for the mining industry, as well as profit estimates for the foreign mining firms through the use of a counterfactual. The data allows us to argue that mining was very beneficial in increasing labour productivity and earning foreign exchange, but also highlights that the economic and social benefits for the economy were less than those suggested by the colonial authorities due to mass exports of profits.

Introduction

“Mavrovouni and Skouriotissa, mountains intractable, naked.
Cursed like Prometheus; like him doomed to have their innards taken out,
For daring to give light to man, for daring to give copper, so many eons ago”.

Cyprus has been associated with copper mining since the Bronze Age, with the mines of Skouriotissa and Lymni in operation in Roman times. Despite the existence of small mining interests throughout the island’s British occupation, with the largest being an asbestos mine at Amiandos, the copper industry remained unimportant until the First World War. Following the discovery of significant ore deposits in 1914, the copper sulphate industry was reinvigorated by significant investment during the interwar period, and by the 1950s the industry grew so that it became the second largest exporter of copper pyrites ore in the

1 Extract from the poem “Τα Μεταλλεία” [The Mines] by Kostas Montis, Pan-Cyprian Federation of Labour [ΠΕΟ], Μεταλλωρύχων Μνήμες [Miner’s Memories], (DVD, Nicosia, 2007)
World. The industry remained important until 1974, whereby the invasion of Cyprus led to the division of the interests of the largest company, the Cyprus Mines Corporation (CMC) across the green line, leading to a precipitous decline in production. The mining and quarrying industry currently employs industry 585 persons and generates value of only 55.5 million Euros, which represents just 0.3% of the Gross Domestic Product (GDP) of Cyprus.

The economic influence of mining and quarrying in Cyprus, specifically of the copper sulphate industry, has been debated extensively. Prior to the Second World War Cyprus was not important in military terms and became important as a British military base only after the Second World War. Hence the first major inflow of Foreign Direct Investment (FDI) began through mining. During the First World War, large copper sulphate deposits were discovered and they were exploited in the interwar period. Yet the economic effects of copper exploitation have not been previously quantified.

Valerio argues that such type of investment usually did not transform the economy and society in an all encompassing way. It created a two-tier economic system of a modern export oriented production directed to European markets, while the rest of the economy remained based on traditional working patterns. In such instances the economic effect of the export enclave to the real economy can be minimal. This view is however disputed by Lewis, who has suggested that in such a dual economy, provided that the wages of modern sector workers can be contained, can lead to the transformation of the whole country to sustainable economic growth through the absorption of the rural surplus labour.

Prior to the development of the copper mining industry in the 1920s, there was no modern export sector that would fit the typology of of Valerio or Lewis. Copper and copper sulphate ceased to be a significant export by the middle ages. Instead, Cyprus earned its foreign exchange through cash crops for European markets that were established in the 14th century by the Lusignan Kings and the major landowners, the Knights Hospitallers; development was

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3 Christodoulou, D., Inside the Cyprus Miracle: the Labours of an Embattled Mini-economy, (Minneapolis: University of Minnesota, 1992) p.xxi, p.127, p.74
restricted to the areas directly under the knights’ control. Cash crop agriculture remained the main exporting product of Cyprus; even after the Ottoman conquest there was a gradual re-emergence of cash crop agriculture in Cyprus. The occupation of Cyprus by Britain in 1878 did not lead to a rapid modernisation of the outdated administration or economic structures: despite some improvements to the judicial system and the introduction of a limited constitution, the emphasis of the British administration was in maintaining the status quo.

As a result the development of Cyprus under British occupation was not spectacular. Recent research indicates that the development level of Cyprus under the British for the period 1921-1938, needs to be revised downwards. In Geary-Khamis 1990 dollars, the GDP per capita of Cyprus in 1938 is GK$1,260, which was substantially lower than Turkey’s (GK$1,724), and placing Cyprus in a similar income bracket than Bulgaria and Romania, which were some of the poorest areas in Southern Europe. In addition, Cyprus was not growing fast enough to “catch-up” to its Southern European neighbours.

On first glance, it seems that the Lewis theory of development based on a modern sector rings true for Cypriot interwar mining. From 1920s onwards there was a substantial expansion of the mining industry, transforming the copper pyrites ore (also known as copper sulphate) industry from a minor player to the chief exporting industry of Cyprus. This transformation poses questions for Cypriot development: did the expansion of the industry transform the economy, or was the pattern of the modern enclave repeated, leaving the majority of the economy in backwardness?

Christodoulou argues that while some improvements to transport were effected due to mining during the period 1921-1938, “the Cyprus Miracle” lays squarely in the post-1945 period. Angelides argues that the standard of living remained very low since Cyprus was still

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12 Christodoulou, D., Inside the Cyprus Miracle (1992) p.127, p.74
overwhelmingly rural in nature, and hence mining did not initiate modern economic growth\textsuperscript{13}. Brey is more optimistic, stating that changes in terms of facilities and administration transformed the Cypriot economy sometime in the 1930s\textsuperscript{14}. Mayer and Vassiliou argue that the Cypriot economy was only positively transformed due to the growth of the copper mining industry. For Mayer and Vassiliou, the Cyprus Mines Corporation (CMC) put in place the necessary investment in the 1930s to allow for an impressive expansion of output during the 1950s, when copper prices were soaring\textsuperscript{15}. Thus for Mayer with Vassiliou, the period 1921–1938 laid the foundation for future growth by setting in place infrastructure improvements which formed a basis for development after the end of the Second World War.

In the official book of the company, Lavender analysed the development of CMC and was positive about the British occupation of Cyprus and the role of the company in developing the country. While stressing the harmonious relationships of CMC with the colonial administration, Lavender argues that the growth of the copper mining industry and of CMC in particular lifted Cyprus out of poverty\textsuperscript{16}. He indicates that the industry became the largest exporter of Cyprus as early as 1925, replacing the staple agricultural exports which had suffered price reversals due to the interruption of global trade during and after the great depression. The story provided by Lavender suggests that foreign owned companies like CMC prompted development through modernisation of the whole economy: for him copper mining saved Cypriots from a life of continued economic and social stagnation.

Lavender describes the establishment of the CMC from the discovery of copper sulphate deposits in 1914 in the ancient site of Skouriotissa, until the global expansion of the company in the 1950s, with a greater descriptive emphasis in the inter war period, and hence there will be no narrative description of the development of the copper industry here. CMC saw growth reversed during the great depression, with the large mines of Skouriotissa and Mavrovouni closed temporarily in 1931 and 1933. Despite such reversals the company survived and

recovered, undergoing significant expansion until the start of the Second World War\textsuperscript{17}. For Lavender, the CMC mining concerns were constantly under threat of closure due to the precarious financial problems, becoming only truly profitable after the Second World War.

This positive view of CMC and other companies is not without its detractors. The Pan-Cyprian Federation of Labour (ΠΕΟ), whose existence was placed under threat during the brutal crackdown of the 1948 strike against CMC, argued that the CMC plundered Cyprus. Following a narrative as suggested by Valerio, the company was extractive in nature, exploiting the island and its workers\textsuperscript{18}. For ΠΕΟ the company was exporting large profits, while at the same time it was using its close relationship with the colonial administration to overpower the fair demands of workers; thus the CMC and other mining companies were essentially extracting wealth from Cyprus without providing benefits to the society.

This article collates and interprets primary data on the mining industry of Cyprus. Then, with the use of a counter-factual exercise, a projection of the profits of foreign mining companies will be attempted. Finally the actual role of the sector in the lives of the average Cypriot will be evaluated and the article will suggest whether mining modernised the economy or followed traditional patterns of enclave development.

**Mining and quarrying output in Cyprus, 1921-1938**

**Methodology**

There was ample information on the volume and nominal value of mining and quarrying exports in the statistical (blue) books; these were supplemented by information in the annual reports of the mining department in Cyprus. Only the output of sand in Cyprus remains unaccounted. These were used to create The Value Added (i.e. part of the Gross Domestic Product or GDP contributed by the mining sector) of mining and quarrying was estimated, and this was then divided to the various products produced in Cyprus. The estimate is in constant 1938 prices, thus it captures growth of output and not of prices (i.e. it is adjusted for inflation).

\textsuperscript{17} Ibid. p.241, 263, p.266

\textsuperscript{18} Pan-Cyprian federation of Labour [ΠΕΟ], Οι Απεργιακοί αγώνες των μεταλλωρύχων και αμιαντωρυχείων του 1948, [The 1948 Metal and Asbestos Miner strikes] (Λευκωσία, ΠΕΟ, 1979) p.8
It was not possible to estimate the intermediate consumption of the mining sector: all quarries and mines on the islands were private companies, whose business files have not been found. However, other European estimates can provide the proportion of value added to gross output. Ivanov calculated the value added to gross output ratio in Bulgaria as 71.2%, and Schulze argued that the ratio of Austrian mining activities was 82%\textsuperscript{19}. Thus based on the above and other European estimates, a conservative estimate of 75% for Cyprus was used to estimate value added\textsuperscript{20}. The share of value added to gross output is assumed constant throughout the period.

**Output of the mining sector**

Table A indicates the available output data collected from the Cyprus Blue Books and the yearly reports of the department of mining. What is significant here is to indicate that the rapid growth of copper sulphate extraction also increased the growth of other non-ferrous metal mining, such as gold ore and copper participate. This became particularly important after CMC completed a processing plant in Xeros in 1934. Ores not related with copper mining did not expand as quickly and did not recover after the general fall of output during the great depression. Asbestos mining also increased its output during the 1920s, but failed to keep up with the rapid growth of the copper sulphate mines during the 1930s.

Table 1 and the Appendix indicates how dramatic the growth of the mining industry was during the interwar period. In 1921, despite the presence of Limni and the beginning of the CMC Skouriotissa copper sulphate mines, the mining sector was still very small part of the economy. The rapid growth of mining was really a growth of copper mining. Hence, growth was intractably linked to the rise and development of the Cyprus Mines Corporation (CMC), an American free-standing company based in California, whose sole concern (in the beginning) were mines in Cyprus. The extraction of copper on an industrial scale is linked to


the growth of the CMC, with the company becoming a catalyst for the technological and social transformation of the island\textsuperscript{21}.

The sector became a substantial source of growth for the economy throughout the 1920s, but underwent a severe reversal during the great depression. The rapid growth of copper mining meant that the sector reached the peak of its importance relative to the economy in 1938; as table 1 indicates, the mining share of GDP underwent a relative decline from that point onwards. Mining and quarrying grew from a small sector of the economy, producing 1.4\% of GDP (i.e. it was 1.4\% of the added value to the total GDP), to being 17.2\% of the total economy of Cyprus in 1938. This suggests that mining value added (the numerator), was growing faster than the economy (GDP the dominator), and hence mining was one of the main drivers of economic growth in the period. Without the development of mining the GDP of Cyprus would be growing much slower. Hence as a first level it must be admitted that the

\textsuperscript{21} Christodoulou, Inside the Cyprus Miracle... (1992), p.70.
Cypriot economy benefited from the increase in mining, if only in macroeconomic terms. From then on there was a relative but not an absolute decline in importance to the economy: After the Second World War other sectors were growing faster than mining, reducing its relative importance.
Table 1: Mineral Production and the economy.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Employed</th>
<th>Share of Economically active population (%)</th>
<th>Share of GDP (%)</th>
<th>Mineral Exports as a share of all exports (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921</td>
<td>&gt; 1,000*</td>
<td>&gt; 1</td>
<td>1.4</td>
<td>8</td>
</tr>
<tr>
<td>1938</td>
<td>9,200</td>
<td>5.8</td>
<td>17.2</td>
<td>62.7</td>
</tr>
<tr>
<td>1952</td>
<td>6,585</td>
<td>3.1</td>
<td>16.7</td>
<td>56.9</td>
</tr>
<tr>
<td>1961</td>
<td>5,300</td>
<td>2.2</td>
<td>9.3</td>
<td>47.1</td>
</tr>
<tr>
<td>1971</td>
<td>4,203</td>
<td>1.5</td>
<td>4.6</td>
<td>22.6</td>
</tr>
<tr>
<td>1976</td>
<td>2,332</td>
<td>1.1</td>
<td>2.3</td>
<td>7.7</td>
</tr>
<tr>
<td>1981</td>
<td>1,511</td>
<td>0.6</td>
<td>1.2</td>
<td>3.8</td>
</tr>
<tr>
<td>1989</td>
<td>700</td>
<td>0.2</td>
<td>0.3</td>
<td>0.9</td>
</tr>
<tr>
<td>2010</td>
<td>585</td>
<td>0.14</td>
<td>0.3</td>
<td>0.8</td>
</tr>
</tbody>
</table>

*The 1921 data is in shift days hence an approximation only is possible.

It is also worthwhile to point out that as an export industry copper mining in Cyprus was very sensitive to global prices and global demand. Hence the industry’s growth was not linear to Cypriot development. A slump in global trade, especially during the great depression (1929-1934) checked the great growth achieved in the latter half of the 1920s. The majority of interwar mineral value added growth took place after 1934 as Cypriot copper ore proved essential to German re-armament. Cypriot ore provided crucial raw materials in which Germany was not self-sufficient: copper and sulphur. Before 1934, Germany imported most of its ore from the biggest European producer of copper sulphate, the Spanish mines of the Rio Tinto Company. Yet Rio Tinto was facing an increasingly difficult situation in Spain, with constant labour unrest and threats of violence from the early 1930s. This led to the decision of Rio Tinto to reduce its investment in its Spanish mines, leading to a reduction of their output and creating a large supply-gap in the European copper sulphate market. With the outbreak of the civil war in Spain in 1936, the demand for Cypriot copper ore was increased further, leading to the exponential growth shown in figure 1.

Sources:
23 Christodoulou, Inside the Cyprus Miracle... (1992), p.70.
25 Ibid. p.259, 261
Table 2: Value added of Cypriot mining and quarrying, in constant and current prices

<table>
<thead>
<tr>
<th>Year</th>
<th>Constant Prices (Real)</th>
<th>Current Prices (Nominal)</th>
<th>Mining deflator</th>
<th>Year</th>
<th>Constant Prices (Real)</th>
<th>Current Prices (Nominal)</th>
<th>Mining deflator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921</td>
<td>£60,176</td>
<td>£38,527</td>
<td>156</td>
<td>1930</td>
<td>£284,825</td>
<td>£244,761</td>
<td>116</td>
</tr>
<tr>
<td>1922</td>
<td>£71,570</td>
<td>£60,854</td>
<td>118</td>
<td>1931</td>
<td>£206,609</td>
<td>£194,145</td>
<td>106</td>
</tr>
<tr>
<td>1923</td>
<td>£105,447</td>
<td>£81,578</td>
<td>129</td>
<td>1932</td>
<td>£154,163</td>
<td>£153,877</td>
<td>100</td>
</tr>
<tr>
<td>1924</td>
<td>£209,899</td>
<td>£170,742</td>
<td>123</td>
<td>1933</td>
<td>£192,028</td>
<td>£215,237</td>
<td>89</td>
</tr>
<tr>
<td>1925</td>
<td>£158,021</td>
<td>£188,184</td>
<td>84</td>
<td>1934</td>
<td>£267,881</td>
<td>£228,990</td>
<td>117</td>
</tr>
<tr>
<td>1926</td>
<td>£232,058</td>
<td>£200,671</td>
<td>116</td>
<td>1935</td>
<td>£375,030</td>
<td>£411,150</td>
<td>91</td>
</tr>
<tr>
<td>1927</td>
<td>£320,159</td>
<td>£292,454</td>
<td>109</td>
<td>1936</td>
<td>£530,793</td>
<td>£538,248</td>
<td>99</td>
</tr>
<tr>
<td>1928</td>
<td>£370,487</td>
<td>£320,112</td>
<td>116</td>
<td>1937</td>
<td>£838,878</td>
<td>£894,803</td>
<td>94</td>
</tr>
<tr>
<td>1929</td>
<td>£443,891</td>
<td>£385,669</td>
<td>115</td>
<td>1938</td>
<td>£1,115,446</td>
<td>£1,115,446</td>
<td>100</td>
</tr>
</tbody>
</table>

Note: Constant 1938, PPP, pounds sterling.

It is clear from the output data that the expansion of interwar mining was a copper ore affair, and in this the importance to the CMC should not be underestimated. The discovery of new copper sulphate ores by CMC did result in the rapid explosion of output and completely transformed the economic structure of the island. Table B in the Appendix captures the dramatic rise, as in the period 1921-1938 the mining value added expanded by a factor of 20.8:1, implying a staggering annual average growth rate of 19.6%. In addition island reached its peak dependence on copper ore related exports in 1938 as the rearmament of Europe reached its peak. Thirdly the increase of output was much faster than the increase of employment. This suggests two things: the company had less impact on population than in terms of output and that the productivity of its workers was higher than in the economy as a whole.

This increase of productivity should not be an underestimated achievement of the FDI investment in mining: any sustained economic growth necessitates an increase in the productivity per labour, and hence a rise in productivity, if undertaken through an increase in the amount of capital invested per worker, can lead to rapid rates of economic growth. Hence the role of the mining sector, through copper mining (out of which the biggest concern was CMC) in terms of GDP, earning foreign currency and in increasing labour productivity were very important and positive in the interwar period. Without the copper mining iFDI Cyprus would have had an even worse interwar income performance.

Yet there is a valid criticism of the copper ventures: besides the formation of copper concentrates that was initiated in 1934 by CMC, there was no further attempts to retain a

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greater part of the copper value chain in Cyprus. For example, although there was no domestic consumption of mining output in Cyprus, the derivatives of the copper smelting process could produce much needed fertilizer, but not such venture was attempted.

The sector’s ability to procure foreign exchange was very important in preventing a reduction of money supply in Cyprus. A reduction in the money supply would increase the rates of interest for loans in the economy and hence further stifle the economic life of the island. The Cypriot pound was tied at par to sterling through a sterling currency board. This meant that in the event of a trade deficit the government would withdraw domestic currency from circulation, since the currency board required one pound sterling to be deposited in London for every Cypriot pound issued. The net exports of the mining companies eliminated the possibility of a large trade deficit becoming a drain to the Cypriot money supply. Thus, the development of the mining sector had real tangible benefits for Cypriots in terms of productivity, technological catching up and in securing foreign exchange.

The Cyprus Mines Cooperation (CMC)

The CMC was an American free standing company, which meant that although its legal presence was in the United States, all of its (original) business was done in Cyprus. It is not clear how much US capital was invested in their first mine in Cyprus, Skouriotissa. There is no doubt that by the 1930s the company was investing heavily in technology never seen before in Cyprus, but there seems that in the 1920s the venture was expected to be financed mainly through retained profits. Thus in the 1920s the lack of funding led to a shortage of capital investment that slowed the exploitation of the orebody. Excavation, transport, refining and loading were done by hand, and it was not until 1924 that candles were replaced by carbide lamps in the underground tunnels. In addition the additional creation of value was minimal due to limited processing, and thus the company failed to garner more of the value added chain of copper production. This held back the development of Skouriotissa mine until the construction of the Xeros processing plant in 1934. Hence we remain unclear about the level of the initial foreign investment in the mining industry, although it appear to have been minimal until the 1920s.

28 The mining companies also expropriated profits abroad, thus the positive contribution to balance of payments was positive but less than the total mining goods exported.
By the late 1920s the CMC managed to successfully increase output by undercutting the price of the European Pyrites Producers Association (EPPA), a copper ore cartel, but had reached a ceiling on what it could sell without direct access to the large German chemical market, which was effectively controlled by the EPPA\textsuperscript{30}.

By the 1930s it was clear that the CMC did contribute to the Cypriot economy by importing machinery that reduced the island’s technological backwardness. The firm had to import machinery and then set up workshops to maintain even the most basic equipment. The CMC imported the first oxyacetylene torch and the first x-ray machine increasing the technological capacity of the island\textsuperscript{31}.

The presence of the company also brought permanent changes in Cypriot labour relations. Being by far the largest industrial employer in Cyprus the company unwittingly enabled the creation of the dynamic labour movement. The workers, with the aid of the emerging communist movement, began organising the first strikes over pay and conditions, the first affecting Mavrovouni in 1936\textsuperscript{32}. Unionisation was fiercely resisted by the company who had the full support of the colonial administration until 1939. After the Second World War, the miners union became pivotal in the growth of the pan-Cyprian federation of labour (IIEO) and the communist party of Cyprus, with important political consequences in the history of Cyprus. This was not unusual; the same process took place in Spain as strikes against the Rio Tinto Company, a copper ore producer, were pivotal in the development of the Spanish labour movement\textsuperscript{33}.

The breakthrough of CMC and of Cyprus in the global copper market coincided with the discovery of the Mavrovouni ore. Mavrovouni was near the existing CMC concern of Skouriotissa, allowed the company to invest in processing facilities at Xeros, which would increase the value added of the exported material. This discovery was deemed so significant that the Rio Tinto Company attempted to purchase a majority share in the CMC in order to

\textsuperscript{30} Harvey, \textit{The Rio Tinto Company} (1981) p.208. In 1936 alone, the Rio Tinto mine in Spain had twelve major strikes between February and July: p.265-266

\textsuperscript{31} Christodoulou, \textit{Inside the Cyprus Miracle…} (1992) p.80

\textsuperscript{32} Ibid, p.82

\textsuperscript{33} Harvey, \textit{The Rio Tinto Company} (1981) p.177
restrict its output\textsuperscript{34}. Although the buyout did not go ahead, Rio Tinto agreed to allow CMC’s copper sulphate to be marketed through the EPPA, on the condition it would restrict its marketed output. Although the CMC agreed in 1928 to limit its output to below 225,000 tons in order to be accepted by the European Pyrites Corporation, the CMC broke its promise in 1928, 1937 and 1938\textsuperscript{35}.

The discovery of Mavrovouni and its entry into EPPA released the company from the marketing constraints that prevented its penetration in the German market\textsuperscript{36}. Cypriot ore was high in copper content, and for technical reasons it was ideally suited to the German industry; the only smelter in Europe capable of treating the company’s copper concentrate was in Hamburg\textsuperscript{37}. Thus the CMC was able to capitalise on the changing demand for copper sulphate: previously low grade copper sulphate was used mainly in the production of acid for sulphur related products and the copper content was seen as an auxiliary material. The introduction of the brimstone processes in acid manufacture meant that the CMC’s copper sulphate, which contained a high concentration of copper and iron and had no other metal impurities, became much more attractive to copper and iron manufacturers\textsuperscript{38}. Mavrovouni began intensive production in 1929 and reached full capacity in 1934. Unlike the slow growth of Skouriotissa, the discovery of Mavrovouni led to a massive investment programme which ensured than the new mine could rapidly increase its production; once again more research is needed to know if investment was through retained profits or by foreign capital inflow. The company’s was further aided in its growth after discovering complex deposits containing silver and gold: prospecting unearthed small deposits of gold and silver near Apliki, Agrokipia, Kokinopezoula, Mathiatis and Troulli. The export of gold and silver ores was very profitable due to the high prevailing price of these metals in the late 1930s and the ability of the company to process them in the Xeros processing plant.

Following the success of the CMC, other companies backed by foreign interests were also established in Cyprus, such as the Hellenic Mining Company, which extracted copper, silver and gold at Kalavassos and Mitsero. From 1929 to 1938 the number of active mines doubled, but the CMC remained by far the largest in terms of output and employment.

\textsuperscript{34} Harvey, \textit{The Rio Tinto Company} (1981) p.209  
\textsuperscript{35} Source: Cyprus, \textit{Statistical (Blue) Books} of 1928, 1937 and 1938. The volume of exports of copper sulphate mined by the CMC was above the limit agreed with Rio Tinto.  
\textsuperscript{36} Ibid. p.210  
\textsuperscript{37} Lavender, \textit{The Story of...} (1962), pp.265-266  
Despite the industry’s impressive increase in output there is debate on the contribution in terms of national income. GDP counts income produced within an area, yet National Income takes into account the possible withdrawals of income in terms of profit/wages earned by foreigners. For Christodoulou, mining had a limited National Income effect, “since mining, being practised as an enclave economy, had no multiplier effect of any significance on the island’s wider economic activity”\textsuperscript{39}. In contrast, the British colonial authorities were very positive about the mining companies, considering Mavrovouni and Skouriotissa as the “the island’s most valuable assets… being exploited in the most efficient way possible by a first-class organisation”\textsuperscript{40}. Here we attempt to provide an answer, through the aid of a counterfactual: How much of the value added calculated remained in Cyprus, benefiting Cypriots?

In terms of employment, the CMC and the Cyprus Asbestos Corporation (CAC) were the largest employers on the island. Data on employment prior to the establishment of the inspectorate of mines before 1926 are not robust, but the figures are more reliable from 1926 onwards. The proportion of total wages to total value added was estimated, by multiplying the average number of daily workers in each mine by the daily wage, and then multiplying the outcome by the total days on which the mine was active. The total wage was then divided by the value added at current prices in order to evaluate how much of the value added was spent on wages, and how much was either capital investment or profits. The results are shown in figure 2.

\textsuperscript{39} Christodoulou, \textit{Inside the Cyprus Miracle}... (1992) pp.77-78
\textsuperscript{40} Oakden, \textit{Report on the Finances} (1935) p.21
It indicates that in terms of wages, value added remained largely constant or falling even at times of great demand, thus releasing substantial amount of income to account for machine depreciation, rent and profit. If the mines were well managed, a substantial profit should have been expected because of the low share of wages to total value added. Labour wages remained less than half of the produced income in the mining sector. Figure 4 also indicates that the mining companies, like other large foreign companies in British colonies, were quite successful in pushing the burden of the depression on its employees by containing the share of total wages to total value added\(^\text{41}\). This means that the mining companies were successful in reducing the wages of the miners, even though the miners were becoming increasingly more productive. This is in part due to the mass underemployment in rural Cyprus, which helped to keep the wages of the miners down throughout the interwar period.

It was not possible to calculate the profit of mining companies, but there is enough information on the activities of the companies in the annual reports of the government inspectorate of mines and labour to estimate the possible magnitude of net profits though a counterfactual. Using primary information on payment of tax, wage payments and capital expenditure, an estimation of potential net profit is estimated as a residual.

The mining companies spent their earned income on capital goods (machinery), purchasing intermediate consumption goods (goods used up in the production of ore), paying for wages, paying rent and on taxes. The cumulative value added in current prices for the period from 1926 to 1938 was £7,320,356 Cyprus pounds. As seen in figure 52, the cumulative sum of wages of Cypriots in the sector for the same period was £2,545,942. Georghalides and Oakden provide estimates of imported capital expenditure by the CMC totalling £750,000 Cyprus pounds. Since the CMC constituted 80% of the market in terms of output and employment, an additional 20% was assumed to be invested in capital by the remaining companies.

The construction of buildings was recorded for the years 1930–1932 in the annual reports of the inspectorate of mines and labour. The average expenditure in building construction for the three year period is assumed to have been constant for the years with no information for this counterfactual exercise. Additional capital expenditure was necessary to open Mavrovouni and on that basis an additional 20% was assumed to have been invested for the Hellenic Mining Company to open the much smaller Kalavassos mine. The total amount invested for the years 1926–1938 was estimated as £1,433,345 Cyprus pounds in the counterfactual exercise. The cumulative royalty payments to the government were £177,345. Thus by subtracting the total wage, total investment and total taxes on production from the cumulative value added, the potential net profit of the foreign mining firms for the period 1926–1938 was estimated as £3,163,724 or 43.2% of the total value added.

Although this is a counterfactual exercise, it indicated that if the mines were well managed, there would be significant residual profit. This does suggest that there is merit to the claim that the foreign companies mainly extracted income without substantial investment in their workers or in the country through taxation. The value added sent abroad as profit must have been significant. Thus, even if the growth of output was helpful to Cypriots in GDP terms, it was less helpful in National Income terms, reducing the impact of the great mining boom on the Cypriot economy. The answer is somewhere in between Christodoulou and the colonial government’s assertions: although the mines aided the Cypriot economy during the period

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1921-1938, the owners of the foreign mining companies must have been copiously rewarded for their investment.

The very low royalties given to the colonial authorities does not explain why the colonial government was so keen to aid the mining concerns. The taxation imposed was clearly limited and it is clear that the mining companies were successful in minimising their contribution to the government revenue. Figure 3 indicates that the cumulative amount of taxation collected by the Cypriot government was a very small percentage of the income generated, while the government was eager to provide assistance to the mining companies in every way possible.

Figure 3: Royalties received from the mining sector, 1924-1938.

Yet despite this, government support was given at all times and from all levels. Fatal accidents in the mines were common, with Skouriotissa mine having a particularly serious fire in 1925. Under Cypriot law, mining fatalities initiated a government inquiry, which could force the company to pay compensation if the coroner deemed that the company was to blame. Yet from 1926 to 1938, there was not a single case where the company was found to blame. Yet from 1926 to 1938, there was not a single case where the company was found to

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43 Varanvna, P., General Secretary of the local Greek Labour Union of the CMC, Μεταλλωρύχων Μνήμες [Miner’s Memories], DVD, (2007). The numbers of dead were unknown as the company failed to keep an accurate check on the employees working underground.
be at fault. In addition the government co-operated to such a degree that the police would imprison workers in cases of gross neglect of their duties in the mines\textsuperscript{44}. The British colonial government saw the foreign mining companies as natural allies against local intransigence: when the colonial office considered replacing the troublesome legislative council with a new body, the government considered placing an unelected official chosen by the mining companies to sit in the Cypriot assembly\textsuperscript{45}. When the Cyprus Asbestos Company asked for a modification of the companies’ law in July 1931, the government took the unprecedented step of calling both the executive and legislative council up to the summer quarters on the Troodos mountains in order to pass the law during the summer recess\textsuperscript{46}.

Yet it seems the mines managed to keep the taxation payment for such support to a minimal level and extracted favourable treatment in most matters. Capital goods and some other goods considered essential to the industry were not subjected to any taxation or duties; the only taxation levied on mining companies were fixed, pre-agreed mining royalties. The royalty was paid at a variable rate on the amount of ore that was exported. Yet, as figure 3 shows, the royalties were on average just 1.5\% of the total government revenue and royalties were suspended during the great depression, when the Cyprus government was in urgent need of revenue\textsuperscript{47}.

**Mining: a positive move forward?**

The mining concerns did absorb some surplus agricultural labour as suggested by Lewis, and it might have remained in part an enclave economy as Valerio suggests, but neither explain fully the benefits and costs of the mining concerns in Cyprus. The development of mining in the interwar period released the economy for macroeconomic constraints (growth, balance of payments) that were the problem of many economies in the interwar period. Mining was positive for Cyprus, even if the absorption of agricultural workers was incomplete and that an enclave economy still persisted.

\textsuperscript{45} Georghallides, *Cyprus and the Governorship*…(1985) p.167; the suggested changes were never attempted since the constitution was permanently suspended in 1931.
\textsuperscript{46} Georghallides, *Cyprus and the Governorship*…(1985) p.637
\textsuperscript{47} The royalties paid to the government fell faster than the drop in output in the period 1930–1935, since the government reduced some royalties and suspended those for asbestos and gypsum. Oakden, *Report on the Finances* (1935), p.22
Taking everything into consideration, the introduction of CMC and other mining corporations was a positive development for the Cypriot economy. At a period when agriculture was in great distress, mining provided substantial increases in GDP. As a result the island did experience a recovery after the great depression in terms of income. Although there was a great increase in employment, it is clear that employment did not rise as fast as output, hence having great increase in the labour productivity per worker. This increase in labour productivity, combined with the increase in more technologically advanced capital than what was seen in the island before, meant that the island’s development prospects were fundamentally changed for the better. The ability to earn foreign currency eliminated the balance of payments constraints to the economy that the system of currency board had imposed, enabling the import of necessary products that Cyprus needed and removing the need for a reduction in the money supply. Cyprus was placed in a different growth trajectory with the development of copper mining during the interwar period. There is no doubt that the “growth miracle” that occurred after the Second World War was clearly based on the benefits provided by the development of the copper mining industry: it created skilled workers, with technological knowhow and higher capital per person available to them, which was essential for an economy to “catch-up” to the developed world.

However such positive developments were not without their drawbacks. The colonial administration and the foreign mining companies had a very close relationship that was undoubtedly unhealthy. The revenues from mining in terms of direct government taxation were surprisingly low, while the rights of workers and their safety were sacrificed. In addition there was no attempt to extend further up the copper value chain, and hence completely transform the development of the island through the creation of an industrial copper and fertilizer industry. Finally the counterfactual exercise indicates that there was substantial revenue extraction away from the island in terms of profits. A more responsible government could have ensured that more of the revenue would remain on the island and hence ensure a higher multiplier of benefits of to the local economy. Yet despite such negative influence mining development in the interwar period set the basis for the transformation of Cyprus after the Second World War, and this would not be possible without the intervention of foreign companies such as the CMC.
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Table A: Total Volume of Produced Mining and Quarrying products, 1921-1938

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Source: Cyprus, Blue Books, 1921-1946; Cyprus, Annual reports of the Mines Inspector of Service (1926-1938)
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