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(Un)sustainability in a Monetary Union: Main Factors in the Escudo Zone Monetary Union (1963-71)

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Abstract

An extensive literature praises economic integration and monetary unions as powerful means for economic convergence between, and the growth of, nations. Several potential factors have been flagged for successful economic convergence, such as labor availability and mobility and the role of initial levels of development (for positive business contagion effects). However, the relevance of this literature can be read differently in the context of a failed monetary union: the Escudo Zone Monetary Union (EZMU, 1963-1971), where policies key for sustainability were in place. This article investigates the operation of the EZMU and examines the important factors in its demise, thereby contributing to the discussion of (un)sustainability of convergence and economic integration.

JEL Classifications: N10; N17; N20; N24; N27.

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Introduction

The post-World War Two period brought an extended interest in economic integration and monetary unions. According to economic historians, two strands of reasoning were behind this political and scientific enthusiasm. One was related to politicians' hopeful belief that international co-operation among members of trade and monetary unions could help to promote peace amongst nations (Dominique Barjot 2008). The other was a technical conclusion on the possibility of improving quality of life through solidarity and convergence among business and trade partners, boosted by the implementation of economic integration (Barry Eichengreen 2009).

Beyond politicians, economists also helped to foster a favorable attitude regarding economic integration and monetary unions' influence on economic growth. After Frank Ramsey's contribution during the interwar period, neoclassical growth models presented optimistic views on the dissemination of prosperity after World War Two.[1] Technological improvements and human capital, among other productive factors, would improve business production capacity through cross-border economic and financial connections among partners. Positive propagation effects and networking linkages would benefit from the free movement of labor and capital (Cass 1965). Government planning for investment and large-scale supportive intervention for technical modernization could guide capital and labor to the best entrepreneurial applications (Tjalling Koopmans 1965). Interconnectedness and substantial spillovers resulting from new production functions would launch new businesses, imitation effects, economic growth, and stability. Contagion effects would spread business and political interconnectedness under modern lifestyles (Anders Ögren 2019, 749-751).

Economists also developed the theory of monetary unions and optimal currency areas as institutional frameworks for business and economic integration, which would then propel global economic growth and prosperity. Robert Mundell (1961) and Peter Kenen (1969) popularized the advantages of monetary unions for economic efficiency. To the extent that productive factors could circulate in a context of free trade, free labor movements, and free cross-border capital flows, the automatic virtues of the market could establish equilibria amongst the national economies of the countries belonging to the same monetary union. Economics textbooks absorbed and disseminated this message (Paul De Grauwe 2003).

Historical evidence from the nineteenth century also provided examples that helped to strengthen confidence in monetary unions as a means of promoting businesses, economic integration, and growth (see Table 1). Economic integration fostered convergence among European and other OECD members (Steve Dowrick and Duc-Tho Nguyen 1989). In the same way, European countries, Japan, and the USA also converged (Robert Barro and Xavier Sala-i-Martin 1992). The European Monetary Union has long been studied, and offers positive views on the topic (Victor Gaspar 2014).

The ideas on integration drawn from the above cases and the apparent advantages associated with such processes were embraced by Portuguese policymakers by the early 1960s. Portugal joined the European Free Trade Association (EFTA) in 1959 and accepted the free-trade commitments of the General Agreement on Tariffs and Trade in 1962. On September 5, 1961 José Gonçalo Correia de Oliveira, adjunct minister of the President of the Board of Ministers, held a press conference at the Lisbon government headquarters (S. Bento Palace) in which he explained the project of the Portuguese Escudo Zone Monetary Union (EZMU) (Oliveira 1961).

[1] David Cass (1965); Ramsey (1928); Robert Solow (1956); Trevor Swan (1956).

Table 1

Overview on Monetary Unions

Monetary Union	Inception Date/Period	Countries and/or Territories Included	Currencies	Central Banks	Relevant Reference
Italian unification	1859-1862 1867 1870 1919 1941	Piedmont-Sardinia and annexed territories (Parma, Modena, Tuscany, Lombardy, Romagna, Sicily, Naples, Marche, and Umbria) Venetia Latium Istria Dalmatia and Ionian Islands San Marino, Vatican State	Lira	Banca d'Italia (after 1893), before, as per the Minghetti-Finali law, 6 issuing banks: Banca Nazionale negli Stati Sardi, Banca Nazionale Toscana, Banca Toscana di Credito, Banca Romana, Banco di Napoli, Banco di Sicilia	Krugman 1993
Latin Monetary Union	1865-1927	France, Belgium, Bulgaria, Spain, Greece, Italy, Romania, Serbia, Switzerland	several	central banks of the participating countries	Timini 2018
German unification	1871	Prussia, North German Confederation, Bavaria, Württemberg, Baden, Hesse	Mark	Reichbank (former Bank of Prussia) according to laws of 14 March and 22 September 1875	De Grauwe 1992
Scandinavian monetary union	1873-1914	Sweden, Denmark, Norway (including Iceland)	Krona	Danmarks Nationalbank, Skandinaviska Banken, Norges Bank, Sveriges Riksbank	-
Polish monetary unification	1917-1924	Poland and the territories coming from the Austrian, Russian, and German empires	Polish zloti	Bank of Poland (Bank Polski)	Berend 2009
Belgium-Luxembourg monetary unification	1921	Belgium and Luxembourg	Belgian franc Luxembourg franc	National Bank of Belgium (until 1935, issuing bank was the Banque Internationale à Luxembourg)	Eichengreen 1991
Switzerland-Lichtenstein monetary unification	1924	Switzerland and Lichtenstein	Swiss Franc	Swiss National Bank	-

Following detailed regulations and instructions on capital operations between the participating territories, and their operations with foreign countries,[2] the EZMU came into effect on March 1, 1963. The benefits of integration intertwined well with the political motivation to keep the Portuguese empire together at a time when the overseas territories of other colonial powers, such as Britain and France, were becoming, or had become, independent. Indeed, a key element of the political propaganda at the time was the argument that the small size of mainland Portugal was "compensated for" by the extension of its empire.[3] The EZMU embraced 23 million people, inhabiting 2,180,000 km^2, and included all businesses in Portugal and its overseas colonial territories: two Atlantic archipelagoes (Cape Verde and S. Tomé e Príncipe), two west-African territories (Guinea and Angola), one east-African territory (Mozambique), and two small Asian territories (Macao and Timor).

There were different escudo currencies in the territories, but the EZMU established a fixed exchange rate at parity (1:1 exchange rate) to stimulate capital mobility.[4] This fixed exchange rate parity makes the EZMU much like the 1866-1914 Latin Union experiment and the 1875-1914 Scandinavian monetary union comprising Sweden and Denmark (including Faroe Islands, Iceland and Greenland). As understood from the economic thinking at the time, adopting a similar model for the EZMU was expected to encourage international trade and investment, minimize rigidities, and facilitate price stability under cooperation among international trade partners (Hugh Rockoff 2011). Indeed, fixed exchange rates in monetary unions have proven to be a decisive condition for decreasing risk for businesses and promoting economic growth in general (Barro and Sala-i-Martin 1995).

Portugal belonged to both a free-trade zone, EFTA, and to a monetary union, EZMU (Xavier Pintado 1964). Both EFTA and the EZMU required the progressive abolition of custom duties.

More openness may pose problems for currency areas because of greater business exposure to shocks: strong asymmetrical shocks, such as the armed conflicts in three of the EZMU's territories, can have severe effects on businesses in currency areas. The more diversified the production basket of each region, the less important the impact of asymmetrical shocks.

Expectations of higher rewards abroad can determine outflows of capital to the detriment of domestic savings and investment, particularly when desynchronized domestic downturns are accompanied by lack of confidence (Paul Krugman 1979). Under such circumstances, governments are "no longer able to defend a fixed parity", and there are balance-of-payments crises (Krugman 1979, 311). A clear example is the 1914-18 World War, which put an end to the lastingly stable monetary regime of gold-standard fixed exchange-rates (Gerd Hardach 1987).

Guerrilla action and the unilateral declaration of independence of Rhodesia in 1965 triggered fears for businesses and activities in the Portuguese overseas territories. In three of the EZMU partners, Guinea, Angola, and Mozambique, local political movements seeking independence from Portugal waged terrorism and guerrilla warfare.[5] These violent

[2] A working group (composed of Nuno Espinosa Gomes da Silva, João da Silva Guerra, and Carlos Maggiolo Saldanha do Valle) appointed by the central bank Vice-Governor, Fernando Emygdio da Silva, produced the regulation and instructions (Banco de Portugal 1962).

[3] *Diário de Notícias* (1962b; 1962d).

[4] *Diário de Notícias*, (1962a; 1962c).

[5] These movements were: PAIGC (Partido para a Independência da Guiné e Cabo Verde) in Guinea and the Cape Verde islands; UPA (União dos Povos de Angola), MPLA (Movimento para a Libertação de Angola) and UNITA (União da Independência Total de Angola) in Angola; and FRELIMO (Frente para a Libertação de Moçambique) in Mozambique.

independence struggles drove capital flight as Portuguese settlers sought to transfer their savings to mainland Portugal for safety reasons.[6]

It is the purpose of this article to explain how clearing mechanisms were implemented to preserve the fixed exchange rate parity between the different escudo currencies in the Portuguese empire in a situation of great imbalances, with increasingly negative cumulative net positions toward mainland Portugal. The stage of development, the availability of productive factors (labor force and capital), local military and social stability (versus guerrilla conflict unrest), productive investment, and distance can explain cross-border interconnectedness amongst the different partners and businesses in a monetary union (De Grauwe 2003). We therefore also investigate the success of economic integration within the EZMU as a platform of economic, business, and financial linkages, in which the shocks of warfare offer the opportunity to study the propagation of spiral effects, such as those lasting until the independence of the overseas territories in 1974-75.

This article contributes to the study of static and dynamic conditions of macroeconomic (un)sustainability of monetary areas by examining the performance of key factors for the EZMU partners' continuing presence in the monetary union. Many different possible factors and models may explain the EZMU territories' net positions, and the consequent payment delays they create after long queuing. This analysis focuses on analyzing some of the main factors suggested from historical and empirical evidence: levels of development, labor availability, geographical proximity to core markets and partners, maritime and flight connections, government policies expressed in public spending, and transmission mechanisms of monetary policies, as well as the key role of terrorism and guerrilla warfare in three of the overseas territories. To understand the dynamics of the EZMU, we identify the relevant factors driving partners' financial positions over time and between territories by means of a series of panel regressions.

We structure the remainder of our article as follows. After presenting the political philosophy and aims of the EZMU in the next section, we then describe our data and empirical models. We then analyze our results and specification issues, before discussing our conclusions. As will be seen, we identify many factors as determinants of economic and business integration. Furthermore, the construction of integration indicators allows us to explain the behavior of net financial positions in conjunction with economic and business integration.

Launching the Escudo Monetary Zone

Economic integration can be hard to define and quantify, but it is commonly accepted that integration is generally successful and positive for businesses, even under different currencies and without any efforts to build monetary unions (Tamim Bayoumi and Eichengreen 1992). One way of approaching economic integration is to look at time series from partners' balances of payments: imports, exports, transfers, and flows of capital between pairs of partners, which depend heavily on the territories' qualitative features.

In the short period of time during which the EZMU existed, the complex accounting of flows within the system is key in understanding its dynamics. The preparation of the required accounting and legal framework took two years. The EZMU began on March 1, 1963, and the available statistical information covers all eight partner territories. The central bank of Portugal and of the EZMU, the Banco de Portugal, was in charge of the accounting, and managed compensation operations to match all payments among the partners.[7] This function was

[6] José Rodrigues da Costa and Mata (2021).

[7] New statutes for the bank were issued for a contract with the state. Decree-law 44814 of December 28, 1962, *Diário do Governo*, nr. 297 of the same date. https://dre.tretas.org/dre/2468392/decreto-lei-44814-de-28-de-dezembro

legally framed in the set of the Banco de Portugal's central functions, which included "a family of public policies aimed at fostering monetary and financial stability, whose provision is nowadays generally (albeit not necessarily) performed by (…) central banks".[8] The Banco de Portugal then delegated the task of executing the monetary policy for the entire set of Portuguese territories, including mainland Portugal, to two other issuing banks with which it cooperated: the Banco de Angola, which issued the Angolan escudo currency, and the Banco Nacional Ultramarino (BNU), which issued all other escudo currencies.[9]

This design makes the Escudo Zone quite different from standard monetary unions. Since mainland Portugal and its overseas territories still had different currencies in place, it showed similarities with currency board arrangements to connect monetary systems controlled by the Banco de Portugal. Yet, the underlying objective of the system design was to build a true currency union with economic integration, with the central bank of the system acting as lender of last resort to the entire system. While there were three issuing banks, it was the central bank—Banco de Portugal—that ultimately decided to print money, define issuing ceilings for each of the issuing banks, and would act, when necessary, in collaboration with the Banco de Angola and the BNU.

The objective of establishing a currency union also underlays the design of the EZMU Fund, which was created to award credit to partners who were struggling in settling payments. Automatic loans were awarded based on current needs, while the concession of special loans required detailed justification to the Board of Directors of the Fund.[10] The composition of the board not only reflected the political grasp of mainland Portugal over its territories, but also showed the strong desire to coordinate between the central bank function and the key institutions in charge of economic development and stabilization mechanisms across the empire. The minutes of the board meetings reveal that most decisions were taken unanimously, yet the vice-governor of the Banco de Portugal had the last word on credit concession ceilings for commercial banking.[11] Thus, credit concession, which creates money, was designed to ensure centralized control over the money supply. Given these features, the EZMU differed quite substantially from a currency board, where additional units of currency are merely backed with foreign currency.[12]

As a means to fulfill these objectives, a clearing system was put in place to track the net positions of the compensation accounts in the territories' exchange funds for each of the partners. These were presented as net debt or net credit positions, depending on the existence of deficits or surpluses.[13] Monthly computations were undertaken until December 1971 when they were ended in the wake of the previous month's monetary reforms.[14] These reforms overturned the previously-dominant free trade intentions and authorized private bank accounts expressed in mainland Portugal escudos to settle the delayed payments to mainland Portugal.[15]

[8] See Stefano Ugolini (2020).

[9] New contracts were signed with these two banks for their role in the EZMU, approved by Decrees-law 44891 and 44892 of February 20, 1963, respectively (Banco de Portugal, 1963).

[10] Composed of seven members: vice-governor of the Banco de Portugal, governor of the BNU, governor of the Banco de Angola, General Director of STPC (*Secretariado Técnico da Presidência do Conselho*), General Inspector of Credit and Insurance, Head of RP (*Repartição do Tesouro*), and General Director of Economic Issues in the Overseas Ministry.

[11] Banco de Portugal, 1963-1973.

[12] Schenk (2013, 37-82; 2013b).

[13] Article 28 of decree-law 44703 of November 17, 1962. To match a net debt position of a territory, the agent of the system (Banco de Portugal) used gold and foreign currencies of the reserve account of this territory at Banco de Portugal, according to articles 29 and 34 of the same decree-law.

[14] Decree-law 478/71 of November 6, 1971.

[15] Decree-law 550/71 of December 15, 1971.

We represented the data for balances of payments flows between partners i and j in square matrix tables A_{ij} . If i=j A_{ij} = 0, which means that the matrix diagonal is obviously zero. Where A_{ij} values differ from A_{ji} values the matrix table is not symmetric. After compensation mechanisms were put into place, the calculation of net positions (NP) between two partners results in a multilateral NP_{ij} matrix, following detailed instructions given by the "agent of the system". the Banco de Portugal.[16] The estimation of cumulative net positions (CNP) since the beginning of the process results in a CNPij matrix, which we also estimated monthly.[17]

Analysis of these matrixes shows considerable flows of payments toward families and bank accounts located in mainland Portugal. The EZMU system of payments led to long delays in the settlement of payments to the mainland. Exchange Funds in the overseas territories could settle their payments to one another, but they lacked the capacity to settle the enormous value of payments that people and firms wanted and needed to make to mainland Portugal. To address this problem, the territories turned to automatic loans from the EZMU Fund,[18] but some territories also needed to secure special loans from the Fund and could never repay them.

The two overseas issuing banks were blamed for not having avoided the accumulation of transfer orders from people and firms.[19] They were instead accused of accommodating credit and banknote issues in Mozambique to money demand, putting pressure on legal ceilings.[20] The accumulation of gold and other international means of payments in mainland Portugal as the result of intra-empire payments precipitated the introduction of a reform in the entire system in 1971.[21]

Mainland Portugal-based commercial banks were also accused of having used the inter-regional payment system to transfer amounts that exceeded regulations, but whose authorization was obtained from the local territories' Exchange Funds.[22] Inefficient control over local Exchange Funds also allowed these entities to authorize illicit transfers.

The small territories of Macao, Timor, Cape Verde and S. Tomé e Príncipe had cumulative net positions of about zero. These territories had productive business specializations and modest amounts of imports for two reasons. First, they had few local elites importing consumption products from Portugal. Second, their surpluses always led to special authorizations from local authorities for transfers to mainland Portugal. This desire of locals to transfer individual or firm funds to mainland Portugal prevented the territories from accumulating significant positive positions. Using the established ceilings for special authorizations for small transfer amounts, the local *Inspeccões do Comércio Bancário* [Inspections of Bank Activities] often conceded them according to the surpluses available in the local Exchange Fund, evoking justifications such as the annual Christmas season greetings, Easter gifts, or parental gifts to children studying in mainland Portugal.[23]

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[16] Banco de Portugal (1971).

[17] Banco de Portugal (1961-1973).

[18] According to articles 29 and 35 of decree-law 44703 of November 17, 1962.

[19] The Bank of Portugal Historical Archives preserve hundreds of letters from people who were waiting for their transfers to the mainland, blaming the issuing banks for the delays (Banco de Portugal 1969a).

[20] *Caixa Geral dos Depósitos* Historical Archives (1964).

[21] The independence movements, particularly FRELIMO, focused on the accumulation of resources in the mainland during the negotiations for the independence of the territories. In the case of of Mozambique, flows of gold for migrants' work in South African gold mining were directed to mainland Portugal to pay for imports used in infrastructure projects such as dams. FRELIMO argued that the colonial power had imposed such projects on Mozambicans without their consent.

[22] Banco de Portugal (1969b, 12).

[23] Parents used the argument that they would like to send extra monetary gifts to their children studying in metropolitan universities after the end of the academic year. Of course, this was only an argument to obtain authorizations for transfers to family bank accounts in mainland Portugal. The local

The large territories of Angola and Mozambique had negative cumulative positions. which arose from technical problems, such as monetary-exchange disequilibria resulting from poor business cooperation, or non-reciprocal business relationships. Their payments to recipients in mainland Portugal suffered increasing lags, as some territories did not possess mainland Portugal escudos or international means of payments to settle them, which obliged a long queuing system for private transfers into mainland Portugal. This queuing reached almost a full year of delay for payments from Angola and Mozambique because of increasing cumulative negative net positions of these territories (Mata 2020).

The operation of the EZMU under unfavorable conditions of guerrilla warfare and terrorism in three of the partners was itself a barrier to the achievement of the political purposes announced in 1961 when the union was created.[24] The Portuguese government was blamed for the failure of cohesion between mainland Portugal and the empire, the real political aim of the EZMU: "When the Government promulgated the Decree-law 44016 on 8 November 1961, which founded the integration of the Portuguese economic space, mainland Portugal had already joined EFTA and the country already faced terrorism in Angola".[25] This political and military environment produced balance-of-payments crises, especially in the largest partners of Angola and Mozambique, which were gradually losing reserves in their Exchange Funds.[26]

Data and Modeling

Data

This article makes use of monthly data from 1963 to 1971 from the eight partner territories of the EZMU. Net cumulative positions are calculated based on the monthly values extracted from matrixes of multilateral flows. We briefly outline below the other variables used in our three econometric models and then explain these models. Our full database is published online on this journal's website.

Distances to mainland Portugal from the partner territories are very different and can imply higher trade and business costs (Iván Arribas, Francisco Pérez, and Emili Tortosa-Ausina 2011). To study the possible effect of distance on different EMZ partners' performances we use "oil-adjusted" distances. These are defined as the product of countries' distance in kilometers to mainland Portugal by OPEC oil prices, based on the OPEC (Reference) Basket, which is an average of current prices of petroleum blends.[27] We make use of oil-adjusted distance differences to reflect the cost of connections, which takes into consideration distance as well as the associated energy transport requirements.

Population densities and urbanization may affect labor availability and business networking thereby affecting economic stabilization mechanics in the EMZ. We examine the influences of population density using population figures retrieved from *Anuários Estatísticos do Ultramar* and actual country areas. Unfortunately, urbanization figures are not consistently available and thus we do not use them in this analysis.

Money supply increased whenever a territory was awarded with loans from the EZMU Fund. How much did such loans fuel payment for imports and impact local economic activities in the EMZ economic integration? To explore this question, we measure money supply using calculated M2 values as the sum of M0 and M1, taken from Ana Bela Nunes, Carlos Bastien,

Boletins Oficiais announced the amounts that could be transferred whenever there were positive positions (for example, *Boletim Oficial de S. Tomé* 1969, 1971).

[24] *Diário de Notícias* (1963a).

[25] Banco de Portugal (1969b, 3-4).

[26] The political discussion of this issue began immediately after the implementation of the EZMU (*Diário de Lisboa* 1964; *Diário de Notícias* 1963b).

[27] OPEC was the main provider of oil to Europe and Portugal.

Nuno Valério, Rita Martins de Sousa, and Sandra Domingos Costa (2011), *Boletins Trimestrais do BNU,* and Banco de Portugal Historical Archives.[28] M0 consists of the sum of coins and bank notes, and M1 consists of the sum of sight, time, and savings deposits, using the terminology of Nunes, et al. (2011).

Dynamics of business competition and integration depend on technology and specialization. Could these factors change production functions and positively impact the economic growth of the territories? To test for this possibility, we use investment figures as a percentage of GDP, as well as the percentage of total public expenditures on economic policy and security (which imperfectly proxy for military expenses), drawn from Luis Filipe Madeira (2008).

Economic growth of the territories, their business performances, and local economic activities are measured by production (GDP). Because of different geographical dimensions and populations, interterritorial analysis requires the use of GDP per capita. Our computations for GDP per capita follow several steps. We take territorial GDP at current prices from Madeira (2008), whose estimates are similar to those of Nunes et al. (2011), and calculate nominal growth rates. We also retrieve values for territorial price indexes, which are identical in the two sources available (Madeira 2008 and Nunes et al. 2011). The base year used is 1939, so the index was transformed to give a base year of 1963, from which the GDP deflator was computed. Given nominal growth rates and GDP deflators, we calculated real growth rates to build chain-linked series for GDP, with 1964 being the base year. Territorial GDP per capita series are obtained by dividing the latter series by the territorial population figures.

Our dataset also includes the number of years of war for each country. Unlike other colonial conflicts, the Portuguese colonial war is well defined in both time and geographical space.[29] In each of the different affected territories, war became a large-scale endeavor warranting increased effort with each passing year, leading to an ever-heavier weight on the economies and institutions of different territories in supporting the war effort. The “years of war” variable complements the spending on security (which as previously mentioned is but an imperfect proxy) and may serve to capture possible non-linearities associated with the intensity of conflict and measure of exhaustion for the Portuguese society.

Current Transactions Balances of the overseas territories toward mainland Portugal express their macroeconomic performance and demonstrate their economic integration capacity. They are calculated as the difference between credits and debits for each partner regarding goods and services, as taken from the balance-of-payments data for mainland Portugal with the overseas territories.[30]

Summary statistics for all the variables employed in the regressions are shown in Table 2A, including a summary description of each variable used for econometric purposes. Correlations between the variables are presented in Table 2B.

The Models

We use the two main empirical models presented below to explain the variable “net positions”, given that cumulative negative positions led to settlement difficulties for payments and provoked disarray in the entire EMZ. Our third model attempts to explain the measure of economic integration built on net positions (we explain our construction of this indicator in detail in Appendix 1).

[28] Banco de Portugal (1975).
[29] The war started in 1961 in Angola, 1963 in Guinea, and 1964 in Mozambique.
[30] Banco de Portugal (1961-1973).

(Model A)

$$NP_{it} = \alpha_{it} + \beta_1 Distance_{it} + \beta_2 \ln(Pop\ density_{it}) + \beta_3 Money_{it} + \beta_4 \ln(GDPpc_{it}) + \beta_5 War_{it} + \beta_6 G_{it}^{Econ} + \beta_7 G_{it}^{Security} + \beta_8 CTB_{it} + \beta_9 I_{it} + \sum_{i=1}^{8} \delta_i Y_i + \varepsilon_{it}$$

(Model B)

$$\Delta NP_{it} = \alpha_{it} + \beta_1 Distance_{it} + \beta_2 \ln(Pop\ density_{it}) + \beta_3 Money_{it} + \beta_4 \ln(GDPpc_{it}) + \beta_5 War_{it} + \beta_6 G_{it}^{Econ} + \beta_7 G_{it}^{Security} + \beta_8 CTB_{it} + \beta_9 I_{it} + \sum_{i=1}^{8} \delta_i Y_i + \varepsilon_{it}$$

(Model C)

$$Economic\ Integration\ Indicator_{it} = \alpha_{it} + \beta_1 Distance_{it} + \beta_2 \ln(Pop\ density_{it}) + \beta_3 Money_{it} + \beta_4 \ln(GDPpc_{it}) + \beta_5 War_{it} + \beta_6 G_{it}^{Econ} + \beta_7 G_{it}^{Security} + \beta_8 CTB_{it} + \beta_9 I_{it} + \sum_{i=1}^{8} \delta_i Y_i + \varepsilon_{it}$$

Models B and C are almost identical to A, with the dependent variable being the first difference of net positions and the economic integration indicator for a given country i at time t, respectively.

A final note on estimation before interpreting our results: the existence of serial correlation and/or heteroskedasticity affected many of the estimated models. As such, model estimation considers cross-sectional time-series feasible generalized least squares (FGLS) with fixed effects regressions. Furthermore, Hausman test results rejected the hypothesis of random effects being preferred to fixed effects. As R-squared cannot be obtained through generalized least squares estimation and it is sound practice to provide a proper measure of fit of the model, we propose a measure $\rho = corr(Y_{it}; \hat{Y}_{it})$, which consists of a correlation between actual and fitted values of the dependent variable. Higher levels of ρ should indicate a better fit of the model.

Table 2A

Summary Statistics

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum	Source	Variables for Econometric Tests	
							Notation	Comment
Territories	8	4	2.02	0	7		α_{it}	Country fixed effects
Net Position (monthly)	864	-14407	35001	-130333	20416	(1)	NP_{it}	Accumulated net position expressed in levels
Economic Integration Indicator	864	65.76	14.91	31.91	89.66	Own		See Appendix 1
Population Density	72	1080.14	2596.83	4.07	8393.44	(2)	$\ln(Population\ density_{it})$	Logarithm of population density
Oil-adjusted distance	72	9827.10	5271.66	3729.22	22739.2	(3)	$Distance_{it}$	
M2	72	3146.84	5772.90	2	27081	(4)	$Money_{\mathrm{it}}$	
GDP per capita	72	5.41	2.15	2.12	9.79	(2), (4)	$\ln(GDPpc_{it})$	Logarithm of real GDP per capita
Number of years of war	72	2.29	3.26	0	11		War_{it}	see note

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum	Source	Variables for Econometric Tests	
							Notation	Comment
Public Spending: Economy	72	16.41	8.41	4.1	49.2	(2)	G_{it}^{Econ}	see note
Public Spending: Security	72	4.94	18.50	2.5	87.5	(2)	$G_{it}^{Security}$	see note
Investment	72	2.80	1.75	0.1	8.5	(2)	I_{it}	as percentage of GDP
Current Trade Balances	72	-421.63	809.80	-2695	522	(1)	CTB_{it}	
Yearly dummies							Y_i	
Error term							ε_{it}	

Sources: (1): Compensation accounts multilateral flows matrixes constructed by the authors from Banco do Portugal (1961-1973) and *Anuários Estatísticos do Ultramar*; (2]: Madeira (2008); (3): OPEC – Statistics & Facts; (4): Nunes, et al. (2011).
Notes: Public spending: expenditures on economic policy/security calculated as percentage of total public expenditures.
Number of years of war: from 1961 for Angola (11), 1963 for Guinea (9), 1964 for Mozambique (8), and zero for the other territories.

Table 2B
Correlation Matrix

	Net Position	Economic Integration Indicator	Population Density	Oil-adjusted distance	M2	GDP per capita	Number of years of war	Public Spending: Economy	Public Spending: Security	Investment	Current Trade Balances
Net Position	1										
Economic Integration Indicator	-0.135	1									
Population Density	0.296*	-0.094	1								
Oil-adjusted distance	0.035	0.258	0.427*	1							
M2	-0.933*	0.179	-0.227	-0.006	1						
GDP per capita	0.086	-0.448*	0.652*	-0.1	-0.013	1					
Number of years of war	-0.715*	0.378*	-0.31*	-0.266*	0.771*	0.082	1				
Public Spending: Economy	-0.043	-0.347*	-0.218*	-0.309*	0.054	-0.213*	-0.241	1			
Public Spending: Security	0.054	0.561*	-0.375*	-0.107	-0.059	-0.269*	0.426*	-0.569*	1		
Investment	0.219	-0.27*	-0.36	-0.576*	-0.229	-0.167	-0.195	0.739*	-0.221	1	
Current Trade Balances	0.603*	-0.014	0.22	0.041	-0.677*	0.088	-0.477*	-0.133	0.14	0.191	1

Note: * denotes significant at 5% level

Empirical Results and Interpretations for Models A and B: Explaining Divergent Behavior of Partners in a Monetary Union

Results for several specifications of models A and B are given in Tables 3 and 4, respectively. Variables which are not statistically significant are omitted from various of the specifications to illustrate the effects of their omission. Although net positions behave explosively over time using monthly data, an application of the Levin-Liu-Chu panel unit-root tests on the basis of yearly data suggests no problems with non-stationarity in the accumulated net position time series (see Mata, Luís Catela Nunes, and Roldão 2021).

For a deeper understanding of the factors that explain the divergent behavior of partners in the EZMU, it is immediately clear that population density, whether in log form or not, is positively associated with improvements in net positions, all else constant, for both models A and B, with varying degrees of statistical significance depending on the model specification. On average, an increase in population density by two people (per square kilometer) is associated with an improvement in a territory's net position by approximately one million escudos, as seen from model B. Territories that experienced greater increases in population density, which may proxy for increases in urbanization levels, benefited the most in terms of their external relationship toward mainland Portugal.

Increases in money supply are found to have an adverse effect on EZMU partners' net positions. As colonies essentially supplied raw materials in exchange for finished goods this is to some extent a predictable result. Goods in demand were not available locally. The greater the money supply, the greater the stimulus to conspicuous consumption of imports from mainland Portugal, the volume and value of which damaged the evolution of territories' net positions. A 1 million escudos increase in M2 approximately negatively impacts net positions by 5 million escudos and net position variations by 0.7-0.8 million escudos.

Curiously, neither GDP nor its growth explain the behavior of net positions over time and across countries. The effects of investment, statistically significant in model A, are negligible in model B, *ceteris paribus*, even if the coefficients are positive. Higher levels of investment relative to GDP are therefore linked with improving net positions, but no relationship is found between investment and variations in net positions.

The number of years of war does not seem to drive net positions toward the mainland, but public spending seems to have a weak explanatory effect. Additional expenses with economic stimuli had mildly positive contributions to the external positions of the Empire's territories; however, once insignificant variables are removed from the estimation, they amount to a positive net position variation of almost 1 million escudos for each additional 1 percent increase in total budget spending (model A, specifications 8 to 10).

Overall, the results seem to indicate a contradiction regarding trade: an improvement in the current trade balance (CTB) between a territory and mainland Portugal is associated with a worsened net position overall (model A, all specifications), but with a positive net position variation (model B, all specifications). This CTB puzzle can be explained by disentangling causality from correlation. CTB improvements are associated, over time, with poorer net positions, meaning that the external trade relations with mainland Portugal were not the main driver of net positions. For example, the data show that Mozambique improved its trade deficit position toward mainland Portugal but net positions for the territory worsened consistently until 1971. However, once we consider variations in net positions and no longer levels, improvements in trade relations are positively linked with net position improvements—in other words, CTBs remained negative, but improved over time, so net positions declined, and the improvement in trade balances had a positive contribution to net positions, which were worsened by financing flows. More exports toward and/or fewer imports from mainland Portugal had, in fact, a positive effect by endowing territories with means of payments to cover their expenditures.

All in all, the factors that emerge as significant in explaining the levels of cumulative net positions (model A) are those related to initial levels of investment, human resources (population availability, here represented by population density), and money supply. Population density and money supply, as well as public spending on economic policy and the CTB are statistically significant in explaining the actual variations in net positions (model B). These results lead us to conclude that profound problems existed related to severe saving-investment imbalances across the territories' economies.

In relation to public savings and expenditures, if the local government budget was running a deficit, the nominal money supply would begin to rise because the political response would be to print money, thanks to mainland loans to fund the deficit and higher BNU issue ceilings. While different territorial governments had no control over money supply, the needs of each territory were conveyed to the EZMU Fund board via its members, such that centralized control over money supply would satisfy local demands subject to the final decision of the Banco de Portugal. This mechanism explains the negative coefficients found for M2. On the other hand, the positive contribution of economic stimuli—*Planos de Fomento* (Development Plans)—largely exceeded the costs of financing by the local territories' governments. This is consistent with the channeling of such amounts into production, rather than consumption, which fueled the deficit positions of major EZMU partners.

Although private investment had a significant and positive influence on the net position of a territory (model A), it is irrelevant in explaining the variations of such positions (model B). In fact, after local consumption was satisfied, domestic surpluses were the main endowment for economic business-cycle recovery, thereby causing saving to be a central problem. Capital accumulation through investment would have been a solution to prevent deteriorating net positions. However, several aspects such as i) the channeling of resources toward consumption and imports, ii) the structural aspects of savings rates in African economies, as identified by Alfredo de Sousa (1970) and others, and iii) the outflows to mainland Portugal, did not lead to the rapid capital accumulation which is key for innovation and crisis recovery (Angus Deaton 2010, 3). As economics reveals the importance of endogenously-produced factor endowments, savings per capita could have been used as a proxy. Even so, savings rates cannot predict investment rates (Barro, Gregory Mankiw and Sala-i-Martin 1995, 103). It is also important to note that economic adjustments after investment may suffer from lags and delays, and occur in different degrees across sectors, because of the so-called Cantillon's effect. Consumption demand determines pricing and the indirectly required production of goods and services.

Finally, trade surpluses are a means of saving, through the accumulation of international means of payment. Trade balance improvements toward the main partner therefore allowed for additional payment capacity, but they were not sufficient to reverse the situation of increased indebtedness toward that partner, i.e. mainland Portugal. In sum, the lack of saving—both domestically and internationally—and capital accumulation associated with increased consumption created a situation of profound imbalances destined to undermine the success of the EZMU.

Table 3
Regression Outputs for Model A—Dependent Variable: Net Positions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log(Population density)	1574.72	1696.03	1851.293						3470.14***	3581.90***
	(1787.5)	(1774.45)	(1765.92)						(1354.31)	(1346.141)
Population density					2.30*	2.38**	2.81***	3.03***		
					(1.20)	(1.18)	(1.06)	(0.870)		
Oil-adjusted distance	0.87	0.83	0.86	1.21**	0.44	0.43			0.259	
	(0.608)	(0.603)	(0.603)	(0.512)	(0.528)	(0.527)			(0.427)	
M2	-5.40***	-5.33***	-5.75***	-5.99***	-5.09***	-5.03***	-4.85***	-5.75***	-5.52***	-5.53**
	(0.809)	(0.795)	(0.481)	(0.423)	(0.786)	(0.771)	(0.745)	(0.417)	(0.461)	(0.462)
Log(GDP per capita)	12927**	11406.5	8766.83	13093.95**						
	(8009.60)	(7412)	(6282.79)	(4782.97)						
GDP per capita					1950.35	1731.29	1307.74			
					(1447.52)	(1329.52)	(1230.31)			
Years of War	-1208.43	-1152.20			-1887.59	-1876.12	-2307.88			
	(1733.52)	(1733.56)			(1643.97)	(1645.81)	(1566.87)			
Public Spending: Economy	265.48				196.57					
	(536.88)				(517.21)					
Public Spending: Security	458.19***	402.20*	293.71**	206.08*	526.39**	486.64***	510.53***	263.28**	313.85**	303.18***
	240.38)	(212.50)	(136.60)	(109.094)	(227.22)	(201.98)	(201.00)	(110.21)	(138.18)	(137.51)
Current Trade Balance	-7.55**	-7.68**	-7.23**	-5.68*	-8.08**	-8.12***	-8.12**	-6.63**	-7.94**	-7.88***
	(3.55)	(3.55)	(3.50)	(3.21)	(3.24)	(3.24)	(3.26)	(3.16)	(3.52)	(3.53)
Investment	2897.88	3675.60**	3480.95**	3408.66***	3614.99*	4228.22***	3671.29***	2970.37**	2672.52*	2203.24*
	(2205.34)	(1549.30)	(1527.35)	(1540.69)	(2186.40)	(1477.31)	(1316.45)	(1217.60)	(1437.56)	(1215.88)
Log likelihood	-604.2081	-604.3301	-604.5501	-605.0943	-602.7649	-602.1226	-602.4509	-603.5372	-604.1766	-605.6907
ρ	0.9467	0.9465	0.9460	0.9450	0.9495	0.9506	0.9500	0.9480	0.9468	0.9437

Standard errors in brackets; *** denotes p<0.01, ** p<0.05, * p<0.1; Estimated using FGLS fixed effects panel regression.

Table 4
Regression Outputs for Model B—Dependent Variable: First-Difference of Net Positions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log(Population density)	581.21*	603.61**	579.79*	716.74***	462.92***	745.68***	486.36***			
	(306.89)	(304.65)	(303.34)	(236.73)	(177.20)	(223.93)	(166.71)			
Population density								0.487***	0.514***	0.519***
								(0.168)	(0.160)	(0.148)
Oil-adjusted distance	0.088	0.092	0.071							
	(0.104)	(0.104)	(0.099)							
M2	-0.689***	-0.752***	-0.765***	-0.741***	-0.740***	-0.734***	-0.783***	-0.797***	-0.794***	-0.793***
	(0.139)	(0.089)	(0.084)	(0.077)	(0.080)	(0.075)	(0.095)	(0.072)	(0.072)	(0.071)
Log(GDP per capita)	1264.90	890.56	933.07	284.08	101.38				67.83	
	(1375.16)	(1178.43)	(1180.60)	(761.40)	(762.09)				(775.00)	
GDP per capita								70.08		
								(172.60)		
Years of War	-156.14						86.96			
	(297.63)						(151.63)			
Public Spending: Economy	75.20	72.02	54.69*	87.69*		84.07		101.75*	99.00*	98.41*
	(92.18)	(92.20)	(28.90)	(52.75)		(51.91)		(53.59)	(53.45)	(53.04)
Public Spending: Security	66.75*	51.45*	54.69*	51.33*		50.69*		37.24	36.18	35.97
	(41.27)	(29.26)	(28.90)	(28.65)		(28.63)		(24.77)	(24.73)	(24.61)
Current Trade Balance	3.63***	3.69***	3.76***	3.69***	4.06***	3.68***	4.04***	4.05***	4.06***	4.06***
	(0.610)	(0.601)	(0.590)	(0.584)	(0.543)	(0.584)	(0.549)	(0.541)	(0.541)	(0.540)
Investment	254.14	237.17			131.43					
	(378.63)	(378.17)			(171.77)					
Log likelihood	-505.5321	-505.6694	-505.8653	-506.1212	-507.5038	-506.1907	-507.6441	-505.5682	-505.6467	-505.6505
ρ	0.9677	0.9675	0.9673	0.9670	0.9653	0.9669	0.9651	0.9677	0.9676	0.9676

Standard errors in brackets; *** denotes p<0.01, ** p<0.05, * p<0.1; Estimated using FGLS fixed effects panel regression.

Results and Interpretations on Economic Integration

Model C uses as its dependent variable a modified version of Arribas, et al.'s (2011) economic integration measure and illustrates certain aspects of the EZMU that were not evident using net positions. This economic integration indicator, explained in Appendix 1, not only contains the information within the dependent variable (net positions toward the mainland) of models A and B (via the degree of openness) but builds upon it, by factoring in relations across all the EZMU partners (via the degree of balanced connection) in one single metric.

The results for model C (Table 5 below) exhibit two main features: first, some factors deemed irrelevant in explaining the behavior of multilateral net positions are in fact not significant; second, the different models agree among themselves in what concerns some of the explanatory factors, and thus may challenge intuition.

As with models A and B, population density remains a very important factor in explaining economic integration. Results point to an elasticity of economic integration of between 4 and 5 percentage points when population density increases by 1 percent.

Increases in GDP per capita are linked to less integration: a 1 percent increase in real GDP per capita is associated with a decrease in the intra-EZMU integration measure of more than 30 percentage points, on average, all else constant. This result is challenging. Did faster-growing economies become more isolated than the others? No, GDP growth over time simply has also contributed to the integration with the rest of the world. At the same time, this result may be explained by the fact that growth is associated with greater economic diversification: those territories which were more specialized, namely in the production of raw materials, lagged economically but also displayed higher potential for increases in integration.

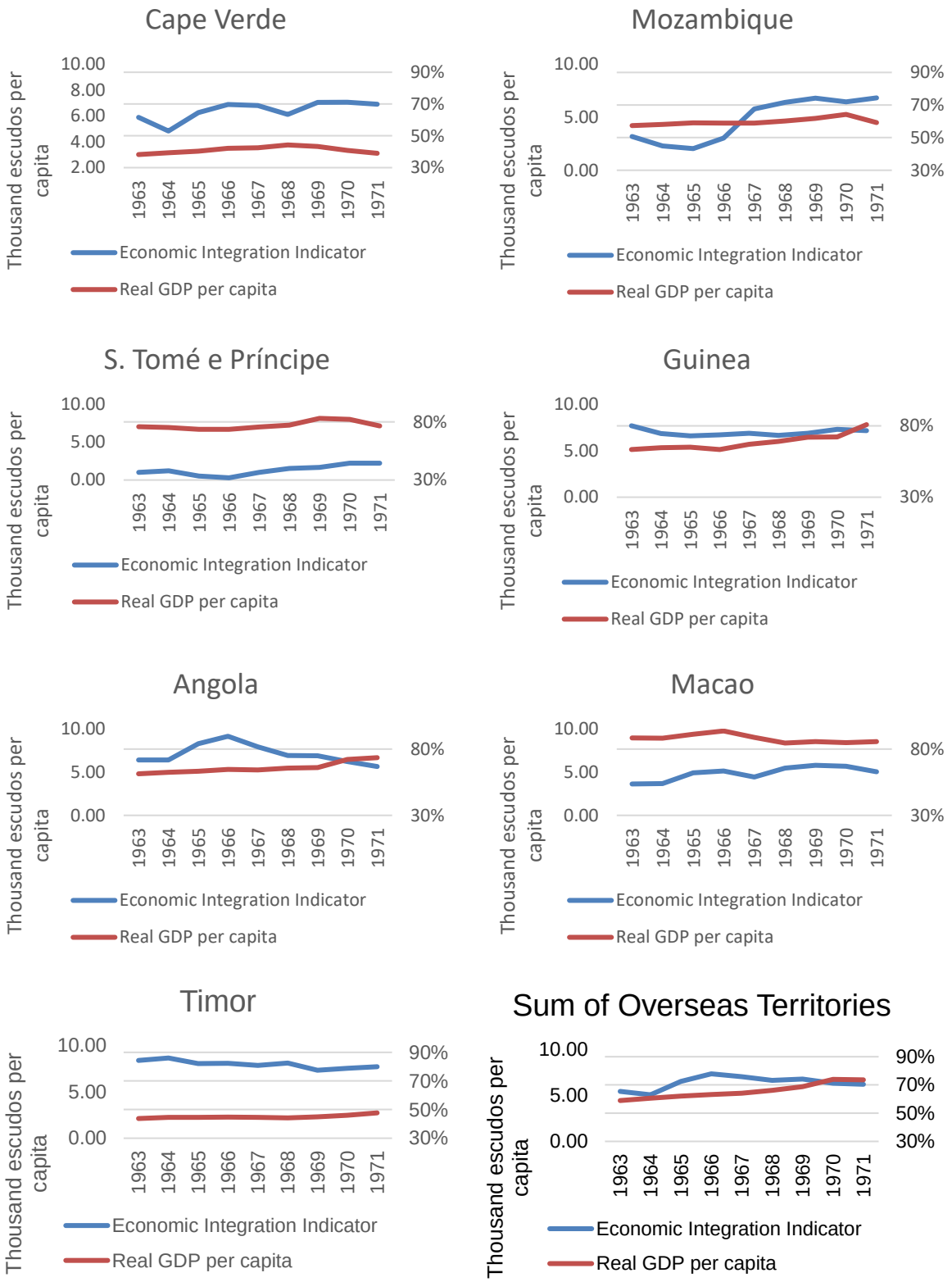
Returning to the data, faster-growing economies are seen not to diverge from the others in terms of integration. Averaging territories' real GDP and GDP per capita growth for the period, Guinea, Angola, and Timor are the three territories with the highest GDP growth rates, against the similarly-paced territories of Cape Verde, Mozambique, and Macao. S. Tomé e Príncipe stands apart from the others. Figure 1 depicts the economic integration indicator defined in Appendix 1, and real GDP per capita to describe the different cases.

Table 5

Regression Outputs for Model C—Dependent Variable: Economic Integration Indicator (see Appendix 1)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log(Population density)	4.92***	4.95***	4.92***	4.70***	3.90***			5.40***	4.61***	4.27***
	(1.10)	(0.929)	(0.927)	(0.890)	(0.818)			(0.828)	(0.774)	(0.814)
Population density						0.004***	0.004***			
						(0.0006)	(0.0005)			
Oil-adjusted distance	0.00002									
	(0.0007)									
M2	-0.0007	-0.0007	-0.0007	-0.001***	-0.001***	-0.0009				
	(0.0005)	(0.0005)	(0.0005)	(0.0003)	(0.0003)	(0.0003)				
Log(GDP per capita)	-33.32***	-33.47***	-32.96***	-34.36***	-32.66***	-35.13***	-30.92***	-30.65***	-28.73***	-28.45***
	(4.92)	(4.08)	(3.78)	(3.36)	(3.21)	(2.88)	(3.05)	(3.45)	(3.32)	(3.29)
Years of War	5.19***	5.19***	5.16***	5.80***	5.53***	4.97***	3.05***	3.96***	3.64***	3.44***
	(1.07)	(1.06)	(1.06)	(0.683)	(0.665)	(0.498)	(0.538)	(0.650)	(0.569)	(0.144)
Public Spending: Economy	-0.105	-0.107					0.013			
	(0.330)	(0.326)					(0.180)			
Public Spending: Security	0.080	0.080	0.103				0.224**	0.271***	0.292***	0.274**
	(0.148)	(0.148)	(0.130)				(0.002)	(0.083)	(0.065)	(0.066)
Current Trade Balance	0.00006	0.00005	0.00009	0.00084		0.002	0.002	-0.0004		
	(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)		
Investment	-0.659	-0.681	-1.02	-1.38**	-1.77***	-0.412				-0.782
	(1.36)	(1.29)	(0.769)	(0.002)	(0.632)	(0.613)				(0.637)
Log likelihood	0.0989	-190.1002	-190.1542	-190.4637	-218.8492	-184.6589	-185.0766	-191.4978	-219.2776	-218.5327
ρ	0.8694	0.8695	0.8691	0.8675	0.8493	0.8938	0.8921	0.8622	0.8471	0.8509

Standard errors in brackets; *** denotes p<0.01, ** p<0.05, * p<0.1; Estimated using FGLS fixed effects panel regression.



Source: Authors' computations based on GDP and net positions data, described before.

Figure 1
Economic Integration Indicator and Real GDP Per Capita Evolution, 1963-1971

The countries growing the most rapidly were those that were most integrated. Yet this does not necessarily mean that they were those that integrated the most, in comparison to others (level versus variation). For example, Mozambique, the second least-integrated territory in 1963, developed and surpassed Angola in 1970, which had been the most-integrated territory in 1965.

The averaged results from the integration measures, based on net positions, group countries in the same way. Table 6 summarizes net position and economic data, while also providing further background on the specialization pattern of each of the territories.

Table 6
Key Economic Data for the Portuguese Empire Territories

Countries	Population 1966 (% growth from 1961 to 1971)	Key goods and commodities produced	Average value of trade with Mainland Portugal as % of total value of trade	Average integration level	Average real GDP per capita growth
			%, 1961-1971		
Cape Verde	279,124 (+25%)	maritime seaports	6	66.47	2.4
Guinea	484,059 (-5%)	tropical oils, rice	50	74.79	3.2
S. Tomé e Príncipe	74,568 (+11%)	cacao	26	38.75	3.7
Angola	5,757,306 (+13%)	coffee, diamonds, iron ore	42	76.82	5.2
Mozambique	8,397,923 (+19%)	cotton (textiles), sugar, cashew nut	50	62.21	3.8
Macao	256,000 (+33%)	gambling, financial business	1	62.72	1.3
Timor	618,717 (+14%)	coffee	41	81.28	5.6
Mainland Portugal	8,643,756 (-3%)	low-technology products: textiles, food products, paper	not applicable	87.12	6.6

Source: Authors' computations from sources listed in Table 2A.

A first group of territories (Guinea, Angola, Timor) appear as most integrated within the EZMU, followed by a second group (Cape Verde, Mozambique, Macao) of very similarly, less-integrated territories. Finally, S. Tomé e Príncipe stands as an outlier, being already relatively well-integrated with the rest of the world because of its specialization in cacao production for the international chocolate industry, in particular supplying Switzerland. Its small, specialized economy was integrated with this world industrial sector but still benefited extensively from EZMU participation, as this facilitated easier access to imports of consumer goods for the local agrarian elite with extensive cocoa farms. In addition, EZMU membership was also key to the

transfer of profits to mainland Portugal, where the families of the local elite had their main residences (no restrictions to capital flows applied).

The economic integration indicator for all the overseas territories combined shows that intra-EZMU integration increased from 1963 to 1971 (by approximately 5 percentage points) with its peak around 1966 and a decline thereafter—the negative coefficient associated with real GDP per capita indicates that such increases coincided temporally with the time path of integration. More detailed examination reveals Angola as the territory with decreases in integration despite its relatively high GDP per capita growth and integration levels. Given the importance of Angola, and that integration was either stagnant or slow-growing in the remaining territories, excepting Mozambique, it is no surprise that the correlation between GDP per capita and integration is negative even when controlling for other factors. While these dynamics were unfolding, integration with the rest of the world was also occurring successfully, evidenced by an improvement in trade and capital balances toward non-EZMU partners during the period.[31]

However, as war raged on and public spending on security and military issues increased, integration within the EZMU increased, *ceteris paribus*. How is it possible that the years of war and spending on security did not play a role in determining individual net positions, but became relevant for explaining territories' integration? Technically speaking, the dependent variable in model C differs from that of the other models and considers the flows between EZMU partners by combining openness and connectedness into a single indicator. As such, the different formulation of the variable may imply, without contradiction, different significance results. Apart from this, even if war and economic spending were not relevant factors in driving the actual imbalances toward the mainland, they may have driven the relations and flows between all partners in the system. The significance of the "years of war" variable in model C (even after using yearly dummies) shows that the prolonged commitment of mainland Portugal to the affected territories became a relevant factor for integration within the system, as war required weaponry inflows, and the presence of troops and institutions, which also drove consumption inflows. The war also led to higher contributions from the different territories' economies and institutions to support the war effort, fostering increased economic activity within the EZMU. This commitment is also captured by additional public spending on security, even with the inclusion of the latter variable, at a smaller scale. An additional year of war has an impact on integration of similar magnitude to a 1 percent increase in population density, all else constant. This means that, although the EZMU's problems grew over time, increasing disparities between countries framed the path of integration among the colonial territories.

Investment, as seen previously, was positively linked with net position improvements (model A), whereas the negative coefficient found in some specifications of model C must derive from the fact that, despite growing deficit positions, economic integration increased overall for the overseas territories. In this context, however, there were paradoxical situations, such as that of the Cahora-Bassa dam in Mozambique, the most important hydroelectric project in Africa at the time. Considerable investment was made in all the overseas territories, in road (and rail) construction, urban infra-structures, airports, and dams for electricity production. High-capital-intensive construction required equipment and technology, which was imported from mainland Portugal, exhausting local reserves of international means of payment.[32] Imports of foreign goods for investment had, however, a net positive effect on territories' payment positions, as indicated by the positive coefficients on the investment variable in the results from models A and B.

[31] Banco de Portugal (1961-1973).

[32] Against the expectations formulated by A. Ramos Pereira (1963b).

Oil-adjusted distance toward mainland Portugal was not significant in model C. Almost all territories were a significant distance from any significant potential markets and international suppliers, whether mainland Portugal or other. This means that one cannot reject the hypothesis that maritime shipping and air transportation did not pose a challenge to integration, thus matching the needs for passengers (labor movements), and freight (for trading).

Model C also confirms the importance of population density as an explanatory factor of economic integration. Population density (proxying labor availability) and public spending on security appear as significant variables with a positive sign. Higher GDP per capita is linked to less integration, meaning that poorer economies integrated more than others. Production diversification within EMZ territories, affecting the degree of openness via their integration to the mainland but also to the rest of the world, helps to explain increasing disparities between territories. As seen in Table 6, Cape Verde specialized in maritime seaports opportunities, S. Tomé e Príncipe in cacao production, Guinea in tropical oils and rice. These territories were mainly price-takers in the global markets, meaning that the destination of exports was subject to market mechanisms. By accessing international markets and obtaining foreign currencies, these territories could exchange them for mainland Escudos, which contributed positively toward EZMU survival. Consequently, waiting periods for transfers to the mainland were much shorter for these territories.

The president of the Industrial Association of Angola declared that continuing terrorism in Angola, Guinea, and Mozambique obliged the mainland Portuguese government to set priorities for public expenditure. This had led to the substantial and progressive increase of non-productive spending rather than the public investment which was indispensable for implementing the development plans of the colonies and their economic integration with the homeland.[33] Throughout the Third Development Plan, which began in 1968, much higher public investment was applied in mainland Portugal, in comparison with the amounts invested in overseas territories. Of course, it was recognized that mainland Portugal "faces the dramatic dilemma of progressing quickly or failing in the competition with EFTA partners", but because of this competition, by the end of the plan's implementation "overseas integration aims (…) will be further than ever".[34]

The 1971 reform was a backward step which reversed the free trade aim of the project begun in 1961. The government, now headed by Marcelo Caetano, launched this reform because the Escudo Zone Monetary Fund was exhausted and could not provide any loans to the Angolan and Mozambican local exchange funds to allow them to satisfy transfers to the mainland. The local exchange funds of the territories were authorized to borrow beyond the EMZ Fund loans and were made responsible for their indebtedness. After the 1971 reform the system continued for three years, while colonial wars were demanding greater military and financial efforts.[35] Although the 1971 reform could allow the transfer of delayed payments that were queuing, the trend on capital flight continued as military conflict raged on.

Economic integration came with highly negative net positions in the cases of Angola and Mozambique, the most populous colonial territories. EMZ Fund loans propelled local GDP and economic growth.[36] However, there was no economic convergence with mainland Portugal in terms of GDP per capita. On the contrary, the gap increased: according to Angus Maddison (2001), the average yearly growth rate of GDP per capita in Portugal was 7.0 percent from 1963-1973, or 6.6 percent based on our calculations for 1961-71 (Table 6). According to *Anuários Estatísticos*, none of the colonial territories grew at such high rate, in what may be

[33] Banco de Portugal (1969b, 3-4).
[34] Banco de Portugal (1969c, 5).
[35] Which were considered to be sustainable in Ulisses Cortês (1963).
[36] As expected in Ramos Pereira (1963c).

labeled as a golden age for the mainland Portuguese economy. The colonial conflict was driving capital flight to the mainland, thereby rendering the EZMU unstable (in not delivering the anticipated benefits). However, population fell in mainland Portugal with emigration to other European countries, notably France, Switzerland and Luxembourg, followed by Germany. The combination of falling population and capital accumulation in the mainland contributed to the relatively high rate of increase in mainland GDP per capita.

Conclusion

The Portuguese Escudo Zone Monetary Union (EZMU) was implemented within a legal framework of regulations and instructions on capital operations among the partners and their operations with foreign countries. The political, economic, and financial stresses of the colonial conflict made "success" for the EZMU very difficult. Under the inter-territorial payments system, the economic and financial features of the empire led to increasingly negative cumulative net positions toward mainland Portugal, contrary to previous political expectations.[37] There were long delays in private transfers toward mainland Portugal, especially from Angola and Mozambique, while expectations were that obstacles would not prevent the success of the escudo area.[38]

According to the models we have presented and estimated, the explanations for economic integration and variation in net negative positions are similar. Labor abundance, proxied by population density, and current trade balances were significant variables and contributed positively to integration, but the variations between territories necessitated what Krugman (1979) calls "emergency loans" from the EZMU Fund. However, settlers, businessmen, and economic groups (industrial conglomerates) did not know how much the government was willing to lend to defend parity.[39] As Krugman (1979) argues, the incomplete knowledge on the part of investors stimulated overseas residents' desire to transfer savings to mainland Portugal as a way of switching their portfolios out of local currency holdings in favor of mainland Portugal's currency. If governments would continue to lend without interruption, the agony of the system would last longer, prolonging the transfer of private savings and profits to the mainland. In the Portuguese colonial regime, the colonial war overlapped market forces, and there were *de facto* asymmetric relationships between the largest colonies and mainland Portugal (Mata et al 2021).

Despite the reform of the EZMU in an effort to defend the fixed exchange rate, lack of confidence drove even greater capital outflows, especially from Angola and Mozambique. As Krugman (1979, 323) states, if they "did not take place, there would be a possibility of a windfall capital loss". In fixed exchange-rate regimes such as in the 1:1 monetary parity of the EZMU, problems with loss of reserves "show that balance-of-payments crises are a natural outcome of maximizing behavior by investors". Essentially, the EZMU was like any other currency union with respect to the aim of free trade and the existence of a common monetary unit. Yet, it differed from other currency unions, in that it had three issuing banks, separate currency circulations, and existed under a colonial political control that aimed at national cohesion. The EZMU was unique among other historical (and colonial) currency unions as military operations and guerrilla warfare occurred in three of its members, leading to a generalized preference for the ownership of assets in the mainland. This article illustrates the extent to which outflows of savings and balance-of-payments crises bring disorder to currency areas leading to queuing to settle payments, and how unmanageable currency areas can become under political unrest. Economic integration created highly negative net positions. Current

[37] Banco de Portugal (1963-1971); Ramos Pereira (1963a).

[38] See José da Silva Lopes (1963).

[39] The EZMU Fund was authorized to issue 1,500 debentures of 1,000 *contos* each, to lend to partners having difficulties to keep the 1:1 parity.

trade balances were significant variables and contributed positively for net negative positions, confirming Krugman's (1979) "emergency loans".

The EZMU is undoubtedly a macro-political experiment (namely for monetary unions under political unrest). For political reasons, there was never any discussion of excluding those colonial territories in military conflict from the EZMU. Although such an exclusion might have made the system more sustainable for the remaining territories participating, the three colonies with guerrilla activities were the largest, and if any one of them achieved independence, the others would likely have followed. Despite great hopes to continue the economic integration of the African Portuguese-speaking territories in a common monetary zone,[40] the financial disarray and the independence of the overseas EZMU territories from mainland Portugal occurred in 1974 for Guinea and in 1975 for all the other territories. All these territories created their own new currencies and their own issuing banks during the first years of independence as symbols of their political sovereignty and self-governance. Although the EZMU could not persist,[41] it had helped to stimulate economic growth in the mainland. Nationalizations of farms, factories, and transport on independence led to a massive exodus of people to mainland Portugal, with large socio-economic consequences.

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Disclaimer

This article reflects the authors' conclusions, which may not necessarily reflect those of the European Central Bank and Nova School of Business and Economics on these issues.

[40] *Jornal do Comércio* (1974).
[41] Mata (2023).

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Appendix 1: Building the Economic Integration Indicator of Model C

There are multiple approaches to measuring the degree of economic integration which include trade, foreign direct investment (FDI), capital and population flows, among others. Yet, taking variables such as FDI or trade flows separately would only explain part of the story, especially for the purpose of panel regression analysis. In this regard, Arribas, et al. (2011) present an approach to measure integration that tackles many of the shortcomings of different methods identified throughout the literature, while taking a network analysis perspective. This aspect is particularly relevant in the study of the EZMU.

The method of Arribas, et al. (2011) defines indicators of distance-corrected trade and combines them in a single degree of trade integration for each country. Those indicators assume that distance matters and that a "gravity" model must be put into place to adjust bilateral relationships between countries.

Although there are trade data for the EZMU, their annual frequency makes the replication of the Arribas, et al. (2011) approach of insufficient value to an extensive analysis. Furthermore, looking at the particular case of the EZMU, net positions may provide a more comprehensive picture by combining trade and investment information, after which the trade component can be dissected by adding CTB as an explanatory variable in panel regression analysis. Therefore, besides looking at trade indicators, an attempt is made (which requires some adjustments to the original model) to use monthly credit and debit flows between the countries that formed the Portuguese Empire during the time of this study (1961-1971).

The original measures for integration can be found in Arribas, et al. (2011). We present below our economic integration indicator with the necessary adaptations, in which we combine two measures: the degree-of-openness and the degree of balanced connection.

Degree-of-Openness

This is usually defined by the ratio between the sum of all trade (exports plus imports) and the GDP of a country. Arribas, et al. (2011) prefer to define the ratio of exports and the distance-corrected GDP, as argued in their work. For credit and debit flows, it is evident that this approach cannot be replicated, as it would be biased toward the flow considered to be "similar" to exports, i.e. credit. An alternative measure that is independent of the net position of a country is therefore needed. A conditional measure can be built, as follows:

$$DO_i = \begin{cases} \frac{C_{ij}}{F_i^*}, & if\ C_{ij} > D_{ij} \\ \frac{D_{ij}}{F_i^*}, & if\ C_{ij} < D_{ij} \end{cases}$$

where C_{ij} stands for credit granted from country i to country j, D_{ij} is the contracted credit by country i with country j and F_i^* is the distance-corrected sum of all financial flows of country i. The procedure for distance-correcting is identical to that performed in Arribas, et al. (2011) and penalizes the denominator in the formula, so that the overall degree-of-openness ought to be higher for countries with higher flows to distant countries. This can be illustrated by an example. Consider two countries X and Y that both have relations with a third country Z in the same amount of credit/debit flow; then, if country X is closer to country Z than country Y, its degree-of-openness will be lower than that of Y applying distance-correcting. Notice that the effect of distance on economic relations is assumed to be linear, which may be a limitation of the model.

Using this alternative formula avoids the problem of applying the unadapted formula to Angola and Mozambique, consistently net debtors and therefore with decaying degrees of

integration over time, or to mainland Portugal, for the opposite reason. As for small countries, such as Cape Verde, Guinea, and S. Tomé e Príncipe, applying such a conditional measure does not alter the time path of the degree of openness so that, even if it (slightly) affects its values, the trend that the measure seeks to capture is still observable if the degree of openness is plotted over time.

Degree of Balanced Connection

This relates to the architecture of the relations between countries. Unlike the degree of openness, this measure can be easily adapted for credit and debit flow data. This measure analyses the proportionality of relations between countries given the size of their individual total flows. It is based on two auxiliary measures:

$$\propto_{ij} = \frac{C_{ij}}{\sum_{j \epsilon N} C_{ij}}$$

where c_{ij} corresponds to the credit flow from country i to country j, such that $\propto_{ij}$ is the relative credit flow in terms of the total credit granted by country i. And:

$$\beta_{ij} = \frac{F_j / d_{ij}}{\sum_{j \epsilon N \setminus i} (F_k / d_{ik})}$$

Where F_j corresponds to the sum of credits and debits of a country and d_{ij} stands for the distance between countries i and j, so that β_{ij} is the relative weight of country j in a distance-corrected world in which country i is not considered. Given this, the degree of balanced connection (DBC) of country i can be defined as:

$$DBC_i = \frac{\sum_{j \epsilon N} \propto_{ij} \beta_{ij}}{\sqrt{\sum_{j \epsilon N} (\propto_{ij})^2} \sqrt{\sum_{j \epsilon N} (\beta_{ij})^2}}$$

Degree of Economic Integration

Combining the degree of openness (DO) with that of balanced connection (DBC), the degree of economic integration of country i is, then, obtained by:

$$DI_i = \sqrt{DO_i \times DBC_i}$$

Even though this measure combines the partial indexes in a somewhat *ad hoc* fashion, it has the advantage of setting the partial indexes and level of economic integration between 0 and 1. It does not, however, measure the evolution of economic integration relative to one single country.

Appendix 2: Validity Tests

We conducted several tests to check if the estimated models are valid.

Multicollinearity

It is common practice in assessing multicollinearity to examine the variance inflation factor (VIF), for which the mean values for each panel points to the absence of collinearity. For this purpose, specifications (1) and (10) for models A and B and specifications (1) and (9) for model C were tested, with the following results:

VIF	(1)	(9)/(10)
Panel A	4.27	2.25
Panel B	4.27	5.11
Panel C	4.27	2.12

Heteroskedasticity

Applying the Likelihood-ratio (LR) yields the following results which indicate no evidence on heteroskedasticity. For this purpose, specifications (1) and (10) for models A and B and specifications (1) and (9) for model C were tested, with the following results:

LR	(1)	(9)/(10)
Panel A	LR chi2(10) = -402.72	LR chi2(10) = -473.22
Panel B	LR chi2(11) = -271.45	LR chi2(11) = -208.30
Panel C	LR chi2(12) = -158.24	No convergence, homoskedastic

Serial Correlation

Conducting the Wooldridge test for autocorrelation in panel data, evidence is found on the existence of serial correlation:

LR	(1)	(9)/(10)
Panel A	F(1,6) = 34.107 P-value: 0.0011	F(1,6) = 28.965 P-value: 0.0017
Panel B	F(1,6) = 38.006 P-value: 0.0008	F(1,6) = 30.820 P-value: 0.0014
Panel C	F(1,6) = 29.154 P-value: 0.0017	F(1,6) = 18.725 P-value: 0.0049

Due to the existence of serial correlation, robust GLS estimation is preferred even though panels are homoskedastic.