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The Latest REM Working Papers

The center of **Research in Economics and Mathematics** (REM) circulates research, notably by its affiliated members, as working papers intended for professional and public discussion and comment. The papers have not been peer reviewed.

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Events

For your 2021 calendar:

9th UECE Conference on Economic and Financial Adjustments, ISEG/UL – Lisbon School of Economics and Management/University of Lisbon, **July 30, 2021**.

The Conference took place in the rooms in the campus and online.

INFER 2021, 23rd Annual Conference, ISEG/UL – Lisbon School of Economics and Management/University of Lisbon, **September 8-10, 2021.** Submissions until **14 June 2021**, via Conference Maker: https://editorialexpress.com/conference/INFER2021.

REM Working Papers

ON THE ROOTS OF UNDERDEVELOPMENT: WRONG EQUILIBRIUM OR MISCOORDINATION ?, JOSE PEDRO PONTES, TELMO PEIXE, *Working Paper 0187-2021*

This paper examines the Big Push industrialization model due to [Murphy et al., 1989] by featuring a game where public and private agents must coordinate their complementary investment decisions and the outcome where all agents invest dominates in payoffs the no-investment alternative. Two different paths of analysis are pursued. If the coordination game has complete information, the selection of the "right" equilibrium appears to be easier if the initial level of total factor productivity (TFP) is not too low. The comparison of the "payoff dominance" and the "risk dominance" criteria due to [Harsanyi and Selten, 1988] shows that the ability to plan jointly different kinds of investment relaxes the constraint on initial TFP. Industrialization can be alternatively modelled as an incomplete information game. In this case, underdevelopment follows from a coordination break, where typically the Government supplies infrastructures which remain underused because the private sector fails to modernize. We find

out that such a coordination break is likelier in economies where the starting level of TFP is low. Consequently, a low initial TFP level tends to create a "Poverty Trap", which however can be overcome by enhancing the ability to coordinate different kinds of investment, namely public and private.

How heterogeneous is the impact of energy efficiency on dwelling prices? Evidence from the application of the unconditional quantile hedonic model to the Portuguese residential market, RUI EVANGELISTA, JOÃO ANDRADE E SILVA, ESMERALDA A. RAMALHO, *Working Paper 0186-2021*

This paper investigates the impact of energy efficiency along the unconditional distribution of residential property prices in Portugal. Using a dataset of more than 256,000 residential property sales from 2009 to 2013, a period that covers an economic depression, unconditional quantile regression analysis reveals that the responsiveness to energy efficiency improvements is different not only as we move from low- to high-priced residential units but also for apartments and houses. While the former show a downward trend in the magnitude of energy efficiency coefficient estimates, the opposite occurs for houses. The latter market segment exhibits clear market discounts at the lowest quantiles of the price distribution, something that is not observable thought conditional mean and quantile regression analysis. Results suggest the existence of a different responsiveness to energy efficiency improvements in the Lisbon region when compared to the rest of the country and that the impact of the Energy Performance Certificate label increases throughout time across all price quantiles. As a by-product of this paper, an unconditional quantile price index shows that the impact of the crisis was not the same across the different market segments, with price decreases being more severe for low- than high-priced properties.

On the classification of financial data with domain agnostic features, João A. Bastos, Jorge Caiado, *Working Paper 0185-2021*

We compare a data-driven domain agnostic set of canonical features with a smaller collection of features that capture well-known stylized facts about financial asset returns. We show that these facts discriminate better different asset types than general-purpose features. Therefore, financial time series analysis is a domain where well-informed expert knowledge may not be disregarded in favor of agnostic representations of the data.

What drives the allocation of motorways? Evidence from Portugal s fast-expanding network, Bruno T. Rocha, Nuno Afonso, Patrícia C. Melo, João de Abreu e Silva, *Working Paper 0184-2021*

This study investigates the factors that influenced the allocation of motorways across municipalities in mainland Portugal over the period from 1981 to 2011. Our analysis, based on Poisson Pseudo-maximum Likelihood models, suggests that population size and market potential in 1981 are important determinants of motorway density in 2011. Likewise, physical and geographical variables also help explain the spatial distribution of motorway investment, as terrain ruggedness, distance to the coast, and distance to the border with Spain are negatively associated with motorway density. In addition, we consider the influence of the proximity to historical and pre-existing transport networks on the allocation of motorways; we find that municipalities that are closer to the 1800's itineraries, the main roads of the 1945's National Road Plan, and 1981's train stations appear to have higher motorway densities in 2011, but this effect is concentrated in the vast and sparsely populated area of the country that excludes what we term the highdensity Portuguese "blue banana". Interestingly, it is also only in this low-density region that partisan alignment between the municipal and the national levels of government appears to affect the allocation of transport investment, which suggests that motorways are more of a political asset in more remote or less urbanised areas.

PUBLIC AND PRIVATE CAPITAL AND PUBLIC PRIVATE PARTNERSHIPS SERIES CONSTRUCTION FOR MOZAMBIQUE, 1960 2017, Teles Huo , Miguel St. Aubyn, *Working Paper 0183-2021*

This article is about the construction of time series on the stock of public and private capital and Public Private Partnerships (PPPs) in Mozambique, from 1960 to 2017, in local currency

(meticais), at constant 2009 prices. The construction of these series was based on the IMF methodology, using data on investment and on the depreciation of the capital stock, based on a geometric depreciation model. For investment, data from the National Institute of Statistics (INE) gross fixed capital formation (GFCF), from 1991 to 2017, were considered. For the periods previous to 1991, INE investment data were extended regressively, from 1990 to 1960, considering the proportions of investment in real GDP, by sectors: public, private and PPPs. For this purpose, the proportions of total investment implicit in the IMF data from 1960 to 2013 were used. These proportions were applied to INE GDP data) to obtain the investment data in metical's at 2009 constant prices, from 1960 to 1990. The result of the capital stock series shows an increasing trend of the total capital stock from 1960 to 2017. From the beginning of the 90's until roughly 2014, the public capital stock exceeded the stock of private capital. The share of the public capital stock in the total capital stock is, in general, greater than the share of the private capital stock. These data shows that despite Mozambique embarked on capitalism, the private sector development remained weak, with a low investment capacity in fixed capital to increase its capital stock.