Paper: **"The Dual Role of Public Debt in Morocco's Investment Dynamics: Empirical Evidence"**

Corresponding Author: Nouhaila Zeroual

Peer review:

ESJ *Manuscript Evaluation Form 2025*
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Date Manuscript Received: 3/12/2025	Date Review Report Submitted: 17/12/2025
Manuscript Title: The dual role of public debt in Morocco's investment dynamics: Evidence from the ARDL approach	
ESJ Manuscript Number: 1073/25	
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Evaluation Criteria:
Please give each evaluation item a numeric rating on a 5-point scale, along with a thorough explanation for each point rating.

Questions	*Rating Result* [Poor] **1-5** [Excellent]
1. The title is clear and it is adequate to the content of the article.	**5**
The title is well formulated and effectively conveys the core elements of the study. It clearly reflects the empirical focus on the relationship between public debt and investment, specifies the Moroccan context, and signals the use of the ARDL methodology. Moreover, the reference to a "dual role" is appropriate, as it aligns with the empirical findings that distinguish between short-run and long-run effects.	
2. The abstract presents objects, methods, and results.	4
The abstract is clear and informative, as it outlines the research objective, the period covered by the data, the key variables, and the econometric methodology. It also provides a concise overview of the main empirical results, notably the positive short-run effect and the negative long-run effect of public debt on investment. That said, the abstract would benefit from the addition of a brief statement highlighting the policy implications, as well as a slight reduction in repetition to improve overall clarity and flow.	

3. There are a few grammatical errors and spelling mistakes in this article.	3
The manuscript is overall clear and easy to follow, but its readability is occasionally affected by grammatical and stylistic weaknesses. These include awkward sentence structures, sporadic subject–verb agreement errors, some repetition, punctuation issues, and inconsistencies in verb tense. Although these points do not compromise the scientific quality or validity of the research, they can reduce clarity in certain sections. A careful language revision, ideally supported by professional proofreading, is therefore recommended before publication.	
4. The study methods are explained clearly.	5
The methodology section is clearly organized and provides a coherent explanation of the data sources, variable definitions, unit root tests, ARDL bounds testing procedure, lag selection criteria, and diagnostic checks. The choice of the ARDL approach is well justified, methodologically appropriate, and fully consistent with the characteristics of the data.	
5. The results are clear and do not contain errors.	4
The empirical results are presented in a clear and coherent manner, with internal consistency and support from appropriate diagnostic tests. The interpretation of the estimated coefficients is sound and well aligned with the existing literature. That said, the discussion could be strengthened by engaging more deeply with Morocco-specific empirical studies and by drawing a clearer distinction between the implications for public investment and those for private investment.	
6. The conclusions or summary are accurate and supported by the content.	5
The conclusion provides an accurate and coherent synthesis of the empirical findings and remains fully consistent with the results discussed in the paper. The policy recommendations are logical, relevant, and firmly grounded in the empirical evidence. Moreover, the "dual nature" of public debt is clearly and convincingly articulated.	
7. The references are comprehensive and appropriate.	5
The reference list is comprehensive, current, and well balanced between foundational works and more recent academic contributions. All cited sources are relevant to the research question and are consistently integrated into the manuscript. Overall, the references largely conform to APA standards in terms of structure, completeness, and citation practice. Only minor formatting adjustments may be needed to ensure full alignment with the journal's specific referencing style.	

Overall Recommendation (mark an X with your recommendation) :

Accepted, no revision needed	
Accepted, minor revision needed	**X**
Return for major revision and resubmission	
Reject	

Comments and Suggestions to the Author(s):
The manuscript would benefit from a careful revision to improve grammatical accuracy and stylistic clarity, and professional language editing is strongly recommended. The abstract could be slightly strengthened by explicitly stating the policy implications in a concise manner. In addition, the discussion section could be enriched by incorporating more Morocco-specific

empirical comparisons and by more clearly distinguishing the implications for private and public investment. Finally, ensuring full consistency in variable notation and in the labeling of figures and tables throughout the manuscript would improve overall coherence. These suggested revisions are minor in nature and do not affect the scientific validity or originality of the study.

Comments and Suggestions to the Editors Only:

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Reviewer Name: Karim Iddouch	
University/Country: International University of Casablanca, Morocco	
Date Manuscript Received: 03/12/2025	Date Review Report Submitted: 05/12/2025
Manuscript Title: **The dual role of public debt in Morocco's investment dynamics: Evidence from the ARDL approach**	
ESJ Manuscript Number:	
You agree your name is revealed to the author of the paper: Yes	
You approve, your name as a reviewer of this paper, is available in the "review history" of the paper: Yes You approve, this review report is available in the "review history" of the paper: No	

Evaluation Criteria:
Please give each evaluation item a numeric rating on a 5-point scale, along with a thorough explanation for each point rating.

Questions	*Rating Result* [Poor] **1-5** [Excellent]
1. The title is clear and it is adequate to the content of the article.	
I find the title relevant and well aligned with the paper's content. However, I believe the reference to "ARDL" may be too technical for non-specialist readers, and a more descriptive formulation could improve accessibility.	
2. The abstract presents objects, methods, and results.	
I think the abstract is well structured, informing the reader about the variables, methodology, and key findings. I recommend adding a stronger statement on policy implications to better reflect the study's significance.	

3. There are a few grammatical errors and spelling mistakes in this article.	
I notice recurring issues in English expression, punctuation, and phrasing. A full professional proofreading would be beneficial to improve clarity and fluency.	
4. The study methods are explained clearly.	
I believe the methodology is appropriate and correctly applied. However, I would like to see clearer justification for lag selection, variable inclusion/exclusion, and a brief discussion on potential endogeneity.	
5. The results are clear and do not contain errors.	
I find the interpretation consistent with the estimations. Nonetheless, some figures appear duplicated or incorrectly labeled, and additional robustness checks would strengthen confidence in the findings.	
6. The conclusions or summary are accurate and supported by the content.	
The conclusions are coherent with the results, especially regarding the dual effect of public debt. I would appreciate more concrete recommendations tailored to Moroccan fiscal and investment policy.	
7. The references are comprehensive and appropriate.	
I find the literature broad and up-to-date. That said, reference formatting is inconsistent and not in full compliance with ESJ style. I recommend standardizing all citations and bibliographic details.	

Overall Recommendation (mark an X with your recommendation) :

Accepted, no revision needed	
Accepted, minor revision needed	
Return for major revision and resubmission	
Reject	

Comments and Suggestions to the Author(s):

I appreciate the relevance of the topic and the quality of the empirical investigation. However, before publication, I strongly suggest the following revisions:
1. Clarify and reinforce the research gap and contribution within the Moroccan context.
2. Improve the methodological section by detailing lag selection, structural break considerations, and robustness tests.

3. Correct all figure and table formatting issues and remove duplication.
4. Enhance the depth of policy implications with actionable insights for policymakers.
5. Provide a full English proofreading to improve readability and academic rigor.
6. Standardize the references according to ESJ's required style.

After these revisions, I believe the paper will be significantly strengthened and more aligned with ESJ's scientific standards.

Comments and Suggestions to the Editors Only:

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Reviewer Name:	Email:
Date Manuscript Received: 4/12/25	Date Review Report Submitted: 15/12/25
Manuscript Title: The dual role of public debt in Morocco's investment dynamics: Evidence form ARDL approach	
ESJ Manuscript Number: 73-10/2025	
You agree your name is revealed to the author of the paper: NO, I do not agree.	
You approve, your name as a reviewer of this paper, is available in the "review history" of the paper: NO, I do not approve. You approve, this review report is available in the "review history" of the paper: YES, I approve.	

Evaluation Criteria:

Please give each evaluation item a numeric rating on a 5-point scale, along with a thorough explanation for each point rating.

Questions	*Rating Result* [Poor] **1-5** [Excellent]
1. The title is clear and it is adequate to the content of the article.	**5**

2. The abstract presents objects, methods, and results.	**3/5**

The abstract identifies the research question, mentions the use of annual data and an ARDL–bounds testing approach and briefly reports the main findings (negative long-run and positive short-run effect of public debt on investment, plus the role of government expenditure, inflation and population growth). However, the description of the methodology is somewhat generic and the link between methods and key numerical results could be presented more precisely (e.g. indicating the sample period, clarifying that GFCF is the dependent variable, and being more explicit on the meaning of "dual effect" of debt).

3. There are a few grammatical errors and spelling mistakes in this article.	**3/5**

The manuscript is generally understandable and written in acceptable English, but there are recurrent issues with grammar (articles, prepositions, agreement) and style (repetitions, long sentences, occasional ambiguity). These do not prevent comprehension but reduce fluency and sometimes obscure the intended meaning. A careful language editing is recommended.

4. The study methods are explained clearly.	**1/5**

The choice of an ARDL–bounds testing framework is appropriate for the data and the mixture of $I(0)/I(1)$ variables and the sequence "unit-root tests → bounds test → ARDL/ECM estimation → diagnostics" is standard. However, the presentation of the empirical model is not fully transparent. There is an inconsistency between the initial static specification (which includes unemployment) and the ARDL model actually estimated (where unemployment does not appear in the tables). Variable definitions (especially GFCF vs "gross capital formation", and the exact transformations/units) are not always consistent and the exact lag structure of the preferred ARDL model is not clearly reported. The authors should clarify the final specification, explicitly state the lag orders and provide a more precise description of how each variable is constructed and used in the regression.

5. The results are clear and do not contain errors.	**2/5**

The main empirical findings are coherent and qualitatively in line with the reported coefficients: public debt has a negative long-run association with investment and a positive short-run effect; government expenditure and inflation are positively related to investment in the long run; population growth is negative. The diagnostic tests and stability checks are reported and appear satisfactory. That said, the reporting of short-run dynamics is rather sparse (only a subset of coefficients is shown), magnitudes and economic significance are not fully discussed and some mechanisms inferred from the results (e.g. the interpretation of inflation as clearly beneficial) are stronger than what the estimates alone can support. It would be helpful to report all short-run coefficients, discuss the size of key effects and moderate causal claims.

6. The conclusions or summary are accurate and supported by the content.	**3/5**

The conclusions correctly summarise the main empirical patterns and emphasise the policy trade-off between using debt to support investment in the short run and the adverse long-run implications of high debt levels. The broader policy discussion (on debt management, private sector development, PPPs, business climate, etc.) is relevant and sensible, but it sometimes goes beyond what is directly estimated in the model. The authors should more clearly distinguish which statements are strictly grounded in their empirical results and which draw on the wider literature and country context, and should temper any strong causal phrasing given the nature of the time-series ARDL framework.

7. The references are comprehensive and appropriate.	**3/5**

The reference list covers a substantial number of theoretical and empirical contributions on public debt,

investment and growth, including recent studies and work on threshold/non-linear effects. However, the literature review is more descriptive than critical and the coverage of country-specific or regional (Morocco/North Africa/MENA) evidence is relatively limited given the single-country focus of the paper. The authors are encouraged to: (i) better organise the literature around mechanisms and methodologies; (ii) sharpen the distinction between public, private and total investment studies; and (iii) integrate more systematically the existing evidence on Morocco or closely comparable economies.

Overall Recommendation (mark an X with your recommendation) :

Accepted, no revision needed	
Accepted, minor revision needed	
Return for major revision and resubmission	**X**
Reject	

Comments and Suggestions to the Author(s):

Literature review
The literature review is broad and up-to-date, but it is not yet sufficiently critical or synthetic. It would benefit from a stronger Moroccan/region-specific lens, clearer conceptual distinctions and a more analytical organisation around mechanisms and methods.

1. **Limited focus on Morocco and closely related MENA economies.**
   The review is largely global and cross-country. For a country-specific application, the reader would expect a more systematic discussion of:
   - Existing empirical work on public debt, investment and growth for Morocco and, secondarily, for North Africa/MENA.
   - How the Moroccan institutional and fiscal framework (e.g. debt management practices, composition of debt, investment strategy) might shape the debt–investment link.

2. **Descriptive rather than critical synthesis.**
   Many studies are summarised sequentially, but the discussion tends to be *enumerative* rather than *analytical*. The review would benefit from:
   - A clearer organisation around mechanisms (crowding-in via infrastructure, crowding-out via interest rates and taxes, debt overhang, uncertainty, composition of spending, etc.).
   - A more explicit contrast of methodologies (time-series vs panel, different measures of debt and investment, identification strategies) and how these may explain divergent findings.
   - A concluding subsection that explicitly distils what is known, what remains ambiguous, and *precisely* what gap this paper fills (e.g. "We extend X by focusing on Morocco; we differ from Y by modelling investment directly rather than via growth; we add Z by combining debt, government expenditure, inflation and demographics in an ARDL framework," etc.).

3. **Conceptual clarity on "investment".**
   The review often shifts between "public investment", "private investment" and aggregate "investment" without always distinguishing them. Since the empirical work uses *gross capital formation* as a share of GDP, it would be helpful if the literature section distinguished clearly which papers examine: Public investment, Private investment orTotal capital formation or growth and how these different concepts relate to the authors' dependent variable.

4. **Link to the Moroccan case and hypotheses.**
   The review does not culminate in explicit testable hypotheses tailored to Morocco (e.g. "Given the

structure of Morocco's public investment and debt profile, we hypothesise that ..."). Formulating such hypotheses would make the subsequent empirical section more focused and help connect literature and results.

METODOLOGY AND VARIABLE DEFINITION

Using an ARDL framework is methodologically defensible given the presence of variables integrated of order I(0) and I(1), and the paper correctly motivates the use of ADF and PP tests to establish integration orders and to rule out I(2) processes. The bounds testing approach and the subsequent ECM representation are standard and appropriate.

That said, several aspects need clearer exposition:

1. **Model specification inconsistency.**
   The baseline equation includes an unemployment variable, UNEMP($_t$), but this variable Does **not** appear in the data description table,

2. **Incomplete presentation of the ARDL model.**
   The methodology indicates that an ARDL model is estimated and the bounds test is applied, but the *exact* empirical specification is not shown. For transparency and replicability, the paper should explicitly present:
   - The full ARDL(p, q_1, ..., q_k) specification with lag orders for each variable.
   - The resulting ECM representation, including the lagged level terms and differenced terms. Currently the text describes the approach generically, but the reader never sees the full equation with coefficients and lags.

3. **Sample size and lag selection.**
   The use of annual data from 1990–2024 provides only about 35 observations. With a maximum of four lags and multiple regressors, there is a real risk of over-parameterization. The paper notes that the AIC is used for automatic lag selection, but it would be important to:
   - Report the *selected* lag structure.
   - Briefly justify that the final model is parsimonious relative to the sample size (e.g. by discussing total number of parameters vs observations).

4. **Treatment of structural breaks and regime shifts.**

   The period 1990–2024 includes major events (e.g. 1990s reforms, the 2008–09 global crisis, Arab Spring, COVID-19). While the CUSUMQ test is used to check stability, the methodology section could acknowledge the possibility of structural breaks and discuss whether break tests or dummy variables were considered. Otherwise, the assumption of parameter constancy over such a long and heterogeneous period may be questioned.

5. **Potential endogeneity.**
   Public debt and investment are likely jointly determined: weak investment can raise deficits and borrowing, while high debt may depress investment. The ARDL approach mitigates some dynamic endogeneity through lagged structures, but the paper does not discuss this issue at all. A short methodological note recognising possible endogeneity and explaining why the ARDL-bounds approach is still informative (or referencing prior applications) would strengthen the econometric justification.

VARIABLES

Dependent variable: GFCF vs "gross capital formation".
At various points the manuscript refers to: "Gross fixed capital formation", "Gross capital formation". The WDI series GFCF (as % of GDP) typically refers to *gross capital formation*, which includes both gross fixed capital formation and changes in inventories. The authors should clearly define the exact

WDI series used (including the WDI code) and its economic content. Moreover, use consistent terminology throughout the manuscript.

- **Independent variables: units and transformations.**
  The text indicates that: Debt is measured as "general government gross debt (% of GDP)", Government expenditure is "final consumption expenditure (annual % growth)", Inflation is "consumer prices (annual %), Population is "population growth (annual %).
  However, the paper does not specify whether variables are used in *levels*, *log-levels*, or *growth rates* in the ARDL. Given the mix of ratios and growth rates, this is important for interpretation of coefficients and for the validity of the cointegration relationship. It would be preferable either to:
- Express all variables in consistent form (e.g. log-levels of ratios), or
- Explicitly justify the chosen mix and discuss how to interpret the resulting coefficients (semi-elasticities vs elasticities, etc.).

Omitted but relevant controls.
For investment, typical determinants include the real interest rate, credit to the private sector, openness or measures of institutional quality. The authors understandably maintain a parsimonious specification, but they should at least discuss the risk of omitted variable bias and justify why this particular set of four regressors (debt, government expenditure, inflation, population growth) suffices for their research question.

DESCRITIVE STATISTICS

The descriptive statistics table reports means, standard deviations, minima, and maxima for all variables, and the accompanying discussion correctly interprets the general magnitude and variability. However, as a foundation for time-series econometric analysis, the descriptive section is somewhat minimal:

1. **Missing correlation structure.**
   A correlation matrix (or at least pairwise correlations between GFCF and the regressors) would be helpful to Illustrate the contemporaneous association between debt and investment.
2. **Additional distributional features.**
   For variables like inflation and growth rates, skewness and kurtosis (or at least comments about outliers and episodes such as price spikes) could help motivate the use of ARDL and identify abnormal periods that might require dummies.

EMPIRICAL ANALYSIS

A number of points require refinement:

1. **Model parsimony and omitted short-run terms.**
   In the short-run dynamics, only the coefficient on the first difference of debt and the constant are reported. The text notes that some short-run variables are omitted due to the lag selection procedure, but this is not sufficiently transparent. It would be appropriate to:
- Report all estimated short-run coefficients (including those that are insignificant) in the table, or
- Clearly state that non-significant lags were eliminated via a specific reduction strategy and briefly justify that approach.
2. **Magnitude and economic significance.**
   The discussion focuses mainly on the *sign* and *statistical significance* of coefficients. It would be helpful to comment on economic magnitudes:

- Is a 0.24 percentage-point decline in investment for a 1 percentage-point increase in the debt ratio large in the Moroccan context?
- How do these magnitudes compare to those found in other studies?

3. **Interpretation of inflation's positive long-run coefficient.**
   The paper interprets the positive long-run inflation coefficient as evidence that "moderate inflation may enhance investment performance". While plausible at moderate levels, this claim should be more cautiously phrased, given that inflation often has non-linear effects and can be a proxy for macroeconomic instability beyond certain thresholds. At minimum, the authors should acknowledge these nuances and refer more explicitly to the specific inflation range observed in their sample.

4. **Link from coefficients to mechanisms.**
   The analysis occasionally jumps from estimated coefficients to relatively strong statements about mechanisms (e.g. crowding-out via higher interest rates, regulatory burdens, etc.) without empirical evidence in the model for those channels. These mechanisms are plausible and supported by the broader literature, but within this paper they should be presented as *interpretative conjectures*, not directly identified effects.

5. **Robustness checks.**
   Beyond standard diagnostics and CUSUMQ, no robustness analysis is reported. For instance, one could consider:

- Alternative debt measures (e.g. external vs domestic, or debt service ratios).
- Alternative investment measures (e.g. public vs private, if data permit).
- Alternative lag lengths or information criteria.
   Even if such robustness checks are not implemented in full, their absence and the associated limitations should be acknowledged.

Conclusions and their support in the analysis

The conclusions accurately summarise the main empirical findings. However, there are two caveats:

1. **Scope of inference vs model content.**
   Several recommendations (e.g. about PPPs, business environment, innovation, institutional quality) are not directly grounded in variables included in the empirical model. While these recommendations are reasonable, they should be clearly framed as being motivated by the *broader literature and country context*, rather than as direct empirical findings of this paper.

2. **Strength of claims about causality.**
   The discussion occasionally leans towards causal language (e.g. "debt undermines investment") without fully acknowledging that the ARDL approach, using aggregate annual data and a limited set of regressors, supports primarily *associations* conditional on the model, not definitive causal identification. A more cautious formulation would improve the academic rigour of the conclusions.

Comments and Suggestions to the Editors Only:

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