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BOJ Discussion Paper

The Research Unit

Assessing Jamaica's Growth Enhancing Reforms

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Abstract

The impact of structural reforms on the macroeconomy are fairly complex and varies significantly under different policy regimes. This paper seeks to assess whether the structural adjustment programme implemented by Jamaica since 2013 was successfully completed and if the reforms had any growth enhancing impact on the country's real output overtime. The paper develops a statistical and econometric procedure to test the implementation status and effectiveness of the reforms, respectively, using a structural reform index modified from Lora (2001) and the exogeneity properties of variables in a vector error correction model. The assessment shows that while there were positive and negative outcomes among the growth enhancing reforms due to a confluence of factors, the reforms were largely successful in bringing about an improvement in the business climate in Jamaica. However, there has been no added impetus to overall economic growth. This is evident in the fact that prior to the implementation of the various reforms, economic growth averaged 0.6 per cent annually from FY2000/01 to FY2012/13. However, over the seven years following the implementation, growth averaged 0.9 per cent, reflecting a mere improvement of 0.3 percentage points. This would suggest that further work needs to be done to jump start the economy. Among this list includes addressing issues in the measurement of GDP, providing sufficient lands for agriculture, identifying large projects that can make a meaningful impact on GDP and providing the platform for the projects effective execution. In addition, a focus on reforms to reduce the cost of electricity in line with the country's main trading partners is essential as well as creating efficient systems to improve Jamaica's resilience to shocks.

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1 Introduction

Jamaica underwent significant structural adjustments in the decade of the 2010s with the primary objective of creating the conditions for sustained economic growth. The main pillars of the structural reform programme included, boosting growth and employment; actions to improve price and non-price competitiveness; upfront fiscal adjustment, debt reduction including a debt exchange to place public debt on a sustainable path while protecting financial system stability and improved social protection programmes (International Monetary Fund, 2013). These reforms were executed under the Government of Jamaica (GOJ) Economic Reform Programme (ERP) between 2013 and 2018. The reforms were consequently implemented under four rubrics: growth-enhancing reforms, tax reforms and fiscal reforms. These reforms also exhibited a unique interconnected nature (see Figure 1 and Table 1, Appendix).

Notwithstanding the apparently successful implementation of the ERP, Jamaica continued to experience anemic GDP growth. This is evident in the fact that prior to the implementation of the various reforms, economic growth averaged 0.6 per cent annually from FY2000/01 to FY2012/13. However, over the seven years following the implementation, growth averaged a mere 0.9 per cent. Table 2, Appendix provides a snapshot of said growth, which collates the average growth of industries, both prior to and following the implementation of the structural reforms.[1] Accepting that a measurement of the impact of the reforms on GDP while being implemented or shortly after implementation is quite ambitious, this paper attempts to evaluate how economic growth has evolved following the enactment of the reforms under the ERP. It is in this context that this paper seeks to assess selected growth enhancing reforms that were implemented since 2013 and to determine whether or not they were successfully completed, using a single metric completion index. Whether or not the reforms had the capacity to facilitate added growth is also explored by way of an exogeneity test.

By analyzing the robustness with which these reforms were implemented and evaluating reform success, the study contributes to the existing literature that focusses on the GOJ's implemen-

[1] While economic activities recovered and/or increased in most industries, the anticipated pace of growth was not forthcoming and as such did not provide the impetus to lift the economy above its anemic state.

tation of growth enhancing reforms in several aspects. In particular, a Growth Enhancing Structural Reform (GESR) Index is developed that quantitatively provides an assessment of the implementation status of each reform as well as an empirical model that ascertains causality between the implemented reforms and growth. While the assessment tools used in this paper are somewhat different from those used in the study published by the Planning Institution of Jamaica (PIOJ), "An Assessment of the Implementation and Impact of the Government of Jamaica's Growth Inducement Strategy", the findings are quite similar in some aspects. For example, the results of this paper are similar to the findings of the PIOJ study on the basis of implementation deficiencies which are an inherent problem in the structure and execution of the growth enhancing reforms. This paper contributes to the literature by harnessing the benefits of causal and non-causal techniques to quantitatively assess the use of selected policy instruments in enhancing Jamaica's growth path. This is achieved by conducting the Test of Exogeneity as well as the development of the GESR index.

The results of the assessment show that the growth enhancing reforms achieved a completion index of 75 per cent. With the less than full implementation, the programme provided some improvements in the business climate, however without the added impetus to economic growth. Further, the results reveal that while all but one of the policy variables are efficient policy tools to be used to engender growth, all (with the exception of the Energy Security and Efficiency Enhancement Project Reform) are ineffective on their own to facilitate the needed fillip to growth. The findings also reveal the need to address issues in the measurement of GDP, providing sufficient lands for agriculture, identifying large projects that can make a meaningful impact on GDP and a focus on reforms to reduce the cost of electricity in line with the country's main trading partners. Nevertheless, it is imperative that policy-makers go beyond these policy tools and deal with the embedded issues of accountability, implementation deficit and strengthen systems to withstand negative external shocks (hurricane, oil prices, epidemiological disasters) as well as address national security issues to be rewarded with sustained real economic growth.

The remainder of the paper is organized as follows. Section 2 discusses literature. Section 3 provides a detailed description of the selected structural reforms in the form of stylized facts, including implementation periods and targets. Section 4 presents a clear description of the data

used in the paper and Section 5 outlines the methodology employed to assess the effectiveness of the structural reforms. Section 6 performs the assessment and presents its results, while Section 7 concludes and provides policy prescriptions for improving structural reform implementation aimed at achieving greater economic growth.

2 Literature Review

The European Central Bank (2017) defines structural reforms as measures that change the fabric of an economy, particularly the regulatory and institutional framework in which economic agents operate. The definition suggests that structural reforms are designed to 'ensure the economy is *fit* and better able to *realise its growth potential*' in a balanced way. The discussion on the theoretical relationship between structural reforms and economic growth is quite limited in the literature. Campos et al. (2017) note that the two major theories of structural reforms on growth are related to the non-linear and linear view. The linear view is related to an economic system where there exist the planned economy, where markets play no meaningful role and a free market economy where government interventions are negligible.[2] The theory of linear structural reform models suggests that as the economy moves from a planned to a free market system, structural reforms are introduced reflecting institutional changes, thereby increasing the long-term economic growth potential of a country. Conversely, the non-linear view of structural reforms suggests that there exist the law of decreasing returns, where the initial rewards from the implementation of reforms are likely to be higher and decreases marginally overtime as the country moves to a fully free market system, ceteris paribus.[3]

Empirical testing of the impact of structural reforms on the economy has been technically problematic and controversial in the literature. Nevertheless, there have been several published papers which have made an effort in quantifying the effect of reforms through various techniques (for example Vu (2017), Marazzo & Terzi (2017), Zulkhibri et al. (2015) and Abadie et al.(2010). Marazzo & Terzi (2017) study found that reforms had an average impact on GDP per capita only

[2]This economic representation follows an upward sloping graph.

[3]Campos et al. 2017 and Belot et. 2007 argue that this has been the case for different groups of countries in Asia and Central Europe as well as OECD countries

after five years. The result stemmed from the use of a non-parametric synthetic control method and parametric dynamic panel fixed effect models. The techniques were used to estimate the impact of 23 structural reforms related to real and financial measures on 22 countries between 1961 and 2000. Additionally, reforms had a negative but statistically insignificant impact in the short-run but induced growth acceleration in the medium-term. This was argued to be influenced by changes in the economic cycle and the associated timing of the implementation of the reforms (Marazzo & Terzi, 2017). Kireyev (2001) tests the effectiveness of two reforms, tax and real effective exchange rate using an Exogeneity Test. The findings indicated that exchange unification was an efficient and effective policy instrument and had an impact on growth. However, the tax reform was not an efficient policy instrument in inducing growth.

Constructing indices in measuring the impact of structural reforms on growth has also been a frequent approach in the literature. In Zulkhibri et al. (2015), the Lilien index was modified for the case of selected emerging economies, with results suggesting there exist a long-run equilibrium relationship between structural change and economic growth. Likewise, Lora & Barrer (1997) built a structural reform index that captured five reform areas throughout 19 Latin American countries between 1985 and 1999.[4] The findings from Lora (2012) paper indicated that on a scale between 0 and 1, the mean index for all countries related to the areas of structural change, improved. Concluding that the reforms were 'far-reaching' but were not exploited at their full potential to achieve sustained growth. Building on the Lora's structural reform index, Greenidge et al. (2016) assessed the short to long-run effects of structural reforms on growth for the Caribbean. Along with panel dynamic OLS estimation, Greenidge et al. (2016) found that benefits to be had from the implementation of reforms were observed only in the long-term with specific focus to strenghtening the institutional quality to stimulate sustained economic expansion.

Examining the literature specifically for Jamaica, Hutchinson and Harris (2012) conducted a qualitative analysis on Jamaica's Growth Inducing Strategy (GIS) to assess the feasibility of the programme in delivering its objective. The authors also assessed the impact of the short-term measures in enhancing economic growth. The findings suggest that Jamaica's weak performance

[4]The reforms were trade policy, tax policy, financial policy, privatization and labor legislation. The index was later updated in 2012 to account for structural reform evolution.

was associated with a myriad of issues related to fiscal imbalance, inefficient use of economic capital, crime and violence, corruption, among others. Thereafter, Tennant (2018) assessed the impact of the GIS crafted under the country's economic reform programme on achieving its growth targets using primary data instruments. The results suggest that 33 per cent of the growth inducing initiatives were timely while 27 per cent and 19 per cent were either major delayed or minor delayed, respectively. It was argued that delays in implementation diminished the growth inducing impact, which hampered economic growth.

3 Growth Enhancing Reforms

The growth enhancing reforms implemented by the GOJ mainly focused on promoting economic expansion through an improvement in the country's business climate. Table 3 in Appendix provides a succinct description of the growth enhancing reforms, implementation periods and associated targets as set by the Government. Due to data availability, the growth enhancing reforms to be assessed by this paper are Land Titling (LAMP II), Business Process Outsourcing (BPO) and Agro-Parks as well as Energy Sector Efficiency and Expansion Programme (ESEEP), Multi-Purpose Business Registration (MPBR), Application Management and Data Automation System (AMANDA) and Port Community System (PCS).

3.1 Land Titling Reform (LAMP II)

The majority of Jamaica's smaller land parcels remain untitled, impeding small farmers' ability to gain access to credit due to a lack of collateral (International Monetary Fund, 2018). Land titling has been typically hampered by high registration costs and the absence of proof of ownership. To alleviate this problem, the land titling reform was introduced in 2000 through the Land Administration and Management Programme (LAMP) to help landowners in Jamaica obtain titles for lands. By 2010, the programme introduced its second phase, LAMP II, to further ease the process of obtaining land titles. LAMP II was a collaborative effort involving the Korea Cadastral Survey Corporation, Geoland Title Limited and LAMP (Jamaica Information

Service, 2011). The mandate of LAMP II was to conduct cadastral mapping, tenure clarification and regularization in project areas towards a reduction in the number of unregistered parcels of land (OPM Communications, 2016). Notably, LAMP II also facilitated investment opportunities by way of using land titles for collateral. LAMP II began in the parish of St.Elizabeth, which was one of the parishes with the lowest land registration in Jamaica (32 per cent).

3.2 Business Process Outsourcing (BPO) Reform

In 2015, a five-year national strategy for the development of Jamaica's outsourcing industry was developed by the Jamaica Promotions Corporation (JAMPRO) to take advantage of the potential economic benefits in the global outsourcing industry. The initiatives were geared towards fast tracking economic growth and job creation by leveraging the resources and expertise of all the relevant stakeholders. This strategic plan for the BPO industry included key actions such as the establishment of policy and legislative framework, infrastructure development, labour market initiatives and actions supporting market penetration (International Monetary Fund, 2015). The key element of the BPO national strategy was the development of human capital. HEART/NTA Trust (HEART) was charged with the responsibility of coordinating human capital development for the industry. Training for entry-level customer service roles was provided through the HEART Fundamentals of Customer Engagement Programme. A specially tailored course, the Supervisory Management Course, was also developed to increase the availability of talent for mid-manager roles.

3.3 Agro-Parks Reform

The Agro-Parks initiative was introduced in 2013 to stabilize the agricultural supply chain by increasing domestic production, improving exports and increasing import substitution. The concept of an Agro-Park materialized as an intensive parcel of land for agricultural production that integrates all aspects of the agricultural value chain, from pre-production to production, post harvesting and marketing. With support from the European Union, Inter-American Development Bank (IADB) and the World Bank, activities were executed within the framework

of a tripartite partnership involving the GOJ, famers/investors and other entities (National Irrigation Commission Limited, n.d.). The parks were to be complemented by improved units, including irrigation, transport infrastructure and technical services.[5] In addition, the initiative was expected to facilitate the establishment of improved linkages between the agriculture and tourism industries. With establishment funds primarily from the IADB, the Agro Parks project commenced with three parks in 2013. The number of parks increased to six in 2015, but two parks were temporarily decommissioned in 2017 and 2018.[6]

3.4 Energy Security and Efficiency Enhancement Project

Through an amendment to the Electricity Act in 2015, the Ministry of Science, Energy and Technology (MSET) was tasked to implement the Energy Security and Efficiency Enhancement Project (ESEEP), which was first introduced in May 2011. Funded by the World Bank, the ESEEP was structured with the intention to support Jamaica's National Energy Policy goals. The ESEEP comprised of three components as detailed in Table A3, Appendix. Overall the project aimed at reducing the cost of energy to the productive sector by strengthen the regulatory and institutional framework to improve sector performance, developing energy efficiency and renewable energy as well as strengthening the capacity of MSET. Although the Bill was enacted in 2015, the initiatives for implementation were delayed by two years due to a lack of funding and absence of a project manager and project coordinator for an extended period.

3.5 Multi-Purpose Business Registration (MPBF)

In June 2015, the multi-purpose business registration form was established to simplify and amalgamate the process required to start a business as governed by the Company Office of Jamaica (COJ). This super form is a 'one-stop-shop' facility that eliminates the need to visit

[5]Irrigation accounts for over 70.0 per cent of the cost to operate an agro-park.

[6]These agro-parks were decommissioned due to ineffective management, as persons employed to provide technical assistance did not have a great understanding of agricultural and farming practices. The decommissioned parks were returned to production in 2019, which returned the total number of operating parks to six.

multiple agencies to complete business registration and removed duplication of various processes. To further boost efficiency and improve overall operations, an online platform for the business registration process was implemented to convert the manual business registration form to an electronic business registration form (EBRF). The EBRF allows people to register their businesses from anywhere in the world. There were three components/targets under the EBRF; (1) review of business registration processes and recommendations to optimize the process; (2) design and development of the business name reservation function for sole trader and limited liability registration types; and (3) implementation of kiosks in four tax offices.

3.6 Application Management and Data Automation (AMANDA) System

In 2014, the AMANDA tracking system was established by the Government to streamline the tracking, monitoring and approval process of construction permits across all parish councils in Jamaica. The AMANDA software was expected to reduce inconsistencies, end bottleneck in task assignments and processes, enhance accountability and increase customer satisfaction. As a result of this integration, users across organizational boundaries, such as the local authorities and the commenting agencies, are able to view, store, track, process and approve applications from any location (Ministry of Local Government & Community Development, 2020).

3.7 Establishment of a Port Community System (PCS)

The Port Authority of Jamaica launched the PCS in January 2016 as a neutral and open electronic collaborative platform to integrate and streamline export and import procedures between public and private stakeholders. This was intended to improve the efficiency and competitive position of the sea and airport communities in Jamaica, relative to its major competitors in the Central American and Caribbean region. In this regard, the PCS sought to optimize, manage and automate port and logistics processes through a single submission of data, connecting transport and logistics chains (Port Authority of Jamaica, 2020). The main

aim of the PCS was to reduce the net cost for trade and logistics transactions. Efficiencies gained through the PCS were intended to facilitate growth in traditional shipping operations to value-added logistics operations. The PCS was fully integrated with the ASYCUDA World system, upon its completion in 2018. This resulted in a modern and effective trade and logistics platform for the Jamaican port community. The Port Community System was expected to improve Jamaica's competitive position in trade, strengthen the country's trade capabilities and address the negative perceptions of Jamaica as having an ineffective bureaucratic business environment (Port Authority of Jamaica, 2020).

There were three specific objectives/targets under the PCS; complying with international standards outlined by the International Port Community System Association; improving the competitiveness of Jamaica's seaport and airport communities to enhance Jamaica's capacity to become a logistics hub; and aid economic growth through faster trans-shipment processes (Patterson, 2016).

4 Assessment Methodology

The paper uses two quantitative approaches towards assessing the effectiveness of Jamaica's growth enhancing reforms over the years 2013 to 2020. Firstly, the paper creates a structural reform completion index for the growth enhancing reforms, which depicts the implementation level across each reform as well as establishes an aggregate measure of their collective implementation status. This was established by assessing the actual outcomes against the targeted outturns that were envisaged under the respective reform programmes. Secondly, the paper employs the Test of Exogeneity technique within an econometric framework to evaluate the relative success of the reforms in driving economic growth.

4.1 Selected: Growth Enhancing Structural Reform Completion Index (GESRI)

The completion index employs time series data on the yearly targets and outturns of the selected growth enhancing reforms over the period 2013 - 2019. The data was gathered from the various agencies responsible for the implementation of the reforms as shown in Table 4 in the Appendix.

For Land Titling, Business Process Outsourcing and Agro-Parks, data on their respective targets and outturns, as outlined under the structural reform programme, are used to assess the status of completion for the full implementation of the associated reforms. However, given the qualitative nature of the targets and outturns for the Multi-Purpose Business Registration Form, the AMANDA System and the Port Community System reforms, a different approach was taken to generate the completion indices. The respective targets are assigned values of 1, while corresponding outturns are assigned either 0 to indicate no implementation, 0.5 to designate partial completion, or 1 to represent full completion. Along similar lines, a blended approach was taken to produce the completion index for ESEEP given its qualitative and quantitative targets.

Constructing the GESR Index

To ascertain the completion status of the reforms that were earmarked to aid economic growth, a single metric completion index is created.[7] This methodology follows closely with that of Lora (2001), but differs in that this paper measures the completion status of reforms, while Lora (2001) focused on policy neutrality. A ratio for each year of each reform's implementation was computed by expressing yearly outturns as a fraction of corresponding yearly targets. Where targets were met and exceeded (ratios greater than 1), ratios are normalized to a value of 1 to reflect full completion for that year. Accordingly, each ratio falls between 0 and 1, with 0 indicating that the reform was not implemented and 1 indicating full implementation. An average of the yearly ratios constitute the completion index for each reform over the sample period as well as an aggregate yearly completion index of all reforms on a yearly basis. With an estimate of each reform's completion status and the yearly completion rate of the programme,

[7] This allows for viable comparisons across reforms.

a final and single completion index was computed, by way of an average, to reflect the overall completion status of the growth enhancing reforms under the ERP. This index represents the average of the completion indices of the seven reforms, which are the simple average of the ratios formed from the associated targets and outturns. This final aggregate completion index, along with the component indices lay the foundation for an initial analysis of the progress and effectiveness of the growth enhancing structural reforms.

4.2 Test of Exogeneity: An Empirical Exploration

This aspect of the paper presents an empirical investigation into the effectiveness of Jamaica's Growth Enhancing Reforms in stimulating economic growth in the country. The empirical model follows aspects of the work done by Kireyev (2001) as discussed in the literature subsection (2), particularly that of weak exogeneity and granger causality associated with the impact of the selected growth enhancing reforms.[8] Due to data limitation, this section examines five of the seven selected growth enhancing reforms to determine the impact, if any, on the targeted outcome (real GDP growth).[9]

4.3 Empirical Model and Data: The Testing Framework (Causal and Non-causal

The paper incorporates a causal model to determine the role of growth enhancing reforms over the reform period within a quasi-experimental framework. In Cameron and Trivedi (2005), one of the causal and non-causal models is Exogeneity. Cameron and Trivedi (2005) further discusses that under the exogeneity framework, the occurrence of causality is determined by "a priori theorizing" associated with hypothesis testing. Kireyev (2001) argues that the aim of econometric modelling is to evaluate the effects on the data generating process stemming

[8]The choice of this paper was predicated on the level of insights garnered from the use of the tools and the econometric grounded procedures which enhances its appeal in capturing causality.

[9]The Multi-Purpose Business Registration (MPBR) and Port Community System (PCS) were excluded from this analysis due to data and time constraints under which this paper was conceived.

from changes in economic policy. In the case of policy response assessments, manipulation of policy instruments is expected to cause partial response in the transmission variables, thereby impacting the target variable. The proposed econometric model to test the effectiveness of the growth enhancing reform on economic growth is as follows:

Simple Linear Model

$$Y_t = \alpha + \ \beta X_t + \gamma Z_t + \delta i + \varepsilon \ldots\ldots with \ldots\ldots \varepsilon_t \sim IN(0, \sigma^2); t = 1, 2 \ldots\ldots T \quad (1)$$

Conditional Model

$$y_t | z_t = \ \alpha_0 + \alpha_1 z_t + v_t \ \ such \ \ that \ \ \lambda_1 = (\alpha_0, \ \alpha_1, \Omega)' \quad (2)$$

Marginal Model

$$z_t = \ \beta_0 + \beta_1 z_{t-1} + \varepsilon_t \ \ such \ \ that \ \ \lambda_2 = (\beta_0, \ \beta_1, \Theta)' \quad (3)$$

Where Y_t denotes the target variable (real GDP growth), which is an endogenous variables to the model, while $t = 1, 2 \ldots\ldots T$ is the sample pre-covid estimation period between March 1999 to the December 2019 quarter.[10] In this case, Y_t represents quarterly seasonally adjusted real GDP growth. X_t is the vector of control variables that are primary determinants for the trend of real GDP growth. The control variables used are the current account balance (% of GDP) and real investment to real GDP ratio. The selection of the control variables is broadly in line with the literature. The transmission variable vector in the model is presented by Z_t. The transmission variable is argued to be the most influenced by a particular reform Kireyev (2001). In this paper, each of the five reforms studied is associated with at least one transmission variable. To capture the time effects associated with the implementation of the reform, the variable i is included in the model. This variable can either represent a step or impulse dummy depending on the time dynamics of the implemented reform. In this regard, the initial time period of the reform dummy will be based on the quarter in which the reform was first implemented.

[10]Pre-covid period are dates prior to the March 2020 quarter, to avoid distorting the results associated with this epidemiological shock, dates after the December 2019 quarter are excluded from the analysis.

The target variable (real GDP), policy instruments and control variables for each reform were gathered from multiple sources (see Table 5 in Appendix and Section 5.1 for analysis details).

Following the identification of the estimating equation, a series of proposed steps are conducted to capture the effectiveness of the growth enhancing structural reforms. These include:

(a) Establishing a congruent full model of x_t, this is built by identifying the appropriate functional form and relevant predictors;

(b) Check for cointegration of control variables x_t;

(c) Depending on the presence of a cointegrating relationship, derive a conditional and marginal model of x_t;

(d) Test for weak exogeneity of the transmission variable(s) Z_t;

(e) Check for granger causality between the target variable Y_t (real GDP growth) and the transmission variable Z_t;

In this paper, the simplified expression represented in equation 1 is transformed into a VAR specification, following an assessment of the simple linear model. For each model, the endogenous variable remains unchanged (real GDP growth). However, control variables will move in and out of the estimation equation depending on its relevance in understanding empirical causality. To prevent model mis-specification and spurious results, all variables were seasonally adjusted using STL decomposition techniques and non-stationary variables were first differenced. Notably, real GDP, the current account balance (% of GDP), the land titling transmission variables (gross capital formation), ESEEP transmission variable (electricity production) and agriculture domestic crop production and export volumes are found to be mean stationary (integrated of order zero (I(0)). The non-stationary variables were subsequently first differenced (see Table 6).[11]

[11]It should be noted that while some variables suggested that it was stationary via the unit root test, visual inspection toward the end of the time horizon showed that the series was not mean-reverting, as such these variables were first differenced to induce complete stationarity with a higher level of significance.

5 Assessment Results

5.0.1 GESR Index: Results

The assessment using the completion index involves evaluating the completion status of each reform and the aggregate completion of the growth enhancing reforms over the period 2013-2019. The likelihood of achieving the anticipated fillip to growth from each reform is also assessed.

Table 7 in the Appendix, contains the completion index for each of the seven selected growth enhancing reforms over the period 2013-2019. The index indicates that reforms pertaining to the BPO and AMANDA System were fully executed, while reforms for the ESEEP, Agro-Parks and MBRF were mostly complete. On the other hand, there were relatively low levels of implementation for reforms associated with the LAMP and PCS, recording 42 per cent and 27 per cent completion, respectively. On aggregate, the index shows an implementation level of 75 per cent for all the selected reforms for the targeted period.

Land Titling (LAMP) Reform

With a land registration rate of below 54.0 per cent in 2010, it was clear that the process of obtaining land titles under LAMP needed to be enhanced (Koh & Knight, 2014). As a result, LAMP II was introduced and accountability targets set through the Extended Fund Facility (EFF) programme in 2014 overseen by the IMF. Prior to these targets, for the period FY2006/07 to FY2014/15, LAMP accounted for, on average, a cumulative 7.7 per cent of the total number of land titles issued by the National Land Agency (NLA). Since the start of the EFF, this proportion increased to 10.9 per cent for the period FY2015/16 to FY2019/20, suggesting growth within the reform. The programme also achieved growth in extending its roots outside of St. Elizabeth, the parish which had the lowest land registration rate of 32 per cent, to the parishes of Trelawny, Hanover, St. Ann and Westmoreland (Koh and Knight, 2014).

Land titling reform success was also seen in the reform's 2014 completion index of 0.90, indicating that 90 per cent of its issuing target was met in that year. However, this rapidly declined to

44.0 per cent in 2015 and 16.0 per cent by 2017.[12] This demonstrated that the issuing targets were consistently missed since 2015 as seen in Figure 2, Appendix. Based on the findings of this assessment, though growth and success can be identified within some aspects of the LAMP reform programme, the unfulfilled targets produced an overall completion index of 42 per cent. This indicates that the reform was merely implemented and could not have achieved the anticipated impetus to growth.

Business Process Outsourcing Reform

With the aim of creating 18,000 jobs in Jamaica by March 2020, an integral aspect of the BPO reform's implementation included training targets, to ensure qualified and able candidates for employment. Figure 3, Appendix shows that for FY2018/19 and FY2019/20, training certifications were below targets by 23.0 per cent and 33.2 per cent, respectively. Industry stakeholders, however, noted that the training shortcomings did not pose a challenge to the industry as the intended training envisaged from HEART at the beginning was not necessary as most candidates already had bachelor degrees and as such possessed the basic requirement for entry-level jobs in the BPO industry.

Notwithstanding the failed training interventions, the industry successfully achieved and surpassed the annual targeted jobs outlined under the initiative by at least 30 per cent each year, as seen in Figure 3, Appendix.[13] This is corroborated by Jampro's Annual Report (2019), which highlighted an average annual growth of 20.1 per cent in employment in the industry since 2016, amounting to 43,183 persons as at end-March 2020. Notably, low skilled employees accounts for approximately 70.0 per cent of employment in the industry. Information received from the industry showed that the sector expanded over the last ten years from 26 companies, local and foreign-owned, to 65 companies in 2020. Further, the report explained that there has been consistent investment in the industry, averaging US$15.0 million per annum since 2015 to date compared to an average of US$5.0 million per annum from 2010 to 2015. With an overall completion ratio of 1, it can be said that the anticipated impetus to growth from this reform

[12]While the respective targets for 2014 and 2015 are available, there is an accumulative target of 15,000 titles for 2014 to 2017. Accordingly, the latter two years were estimated to be 5,750 each after accounting for 2014 and 2015.

[13]This was indicative of a normalized completion ratio of 1.0 throughout the period.

is high.[14]

Agro-Parks Reforms

Based on consultation with key industry players, Agro-Parks are currently utilizing approximately 65.0 per cent of the 1,400 acres of lands assigned under the reform initiative. In addition, only approximately 55.0 per cent of the lands currently available for agro-parks are irrigated, which makes production on the remaining 45.0 per cent very costly and ineffective.

Figure 4, in the Appendix shows the annual output from the Agro-Parks between 2013 and 2019, along with the targeted amounts envisaged under the reform programme. For the period 2013-2016, despite limited resources, output from the parks exceeded the targeted levels by, on average, 39 per cent. However, output fell below the targeted amount by an average of 26 per cent for the remaining three years, due in part to the decommissioned parks. As a result, the reform saw an overall completion index of 0.89, which indicates that approximately 89 per cent of the targeted agricultural output was achieved. Since the commissioning of the Agro-Parks, the agriculture industry grew, on average, by 1.8 per cent, 2.8 percentage points lower than the average growth recorded over the previous 7 years where there were no agro-parks. Given that increased agriculture output cannot singlehandedly stunt the growth of the agriculture industry, it is likely that the direct impact of the Agro-Parks on the industry is being masked by other intervening factors, for example adverse weather conditions. However, it is fair to note that the increased output from the Agro-Parks would have contributed positively to domestic production, although the sufficiency remains in doubt. For a meaningful contribution to domestic production and economic growth to be made, industry players are of the view that approximately 17,000 acres of irrigated land is required for Agro-Parks. At that level, the parks will be able to contribute approximately 3.5 per cent of total agricultural output in Jamaica.

[14]Despite the level of investment and job growth, the indirect estimate of growth by STATIN for the BPO industry remains low as reflected in the National Income and Product estimates. (This estimate uses STATIN's assessment for growth within the Business Activities including Renting of Machinery Equipment sub-industry, captured within the Real Estate, Renting Business Activities industry). For the five-year period since 2015, the sub-industry recorded annual average growth of 0.8 per cent, compared to an annual average growth of 0.9 per cent, three years prior to the implementation of the BPO strategy. It appears that the full impact on growth from the BPO industry is not being captured the national income accounts.

However, less than 9.0 per cent of the required amount of lands is currently available to the agro parks.

Based on the assessment, the paper finds that while the implementation of the Agro-Parks reform were incomplete, for the parks to make a creditable contribution to economic growth, output needs to be conducted on a much larger scale with more irrigated lands.

Energy Sector Efficiency and Expansion Programme

Among the three components outlined under the ESEEP, only the first exceeded or met all targets. For component two, the first target was missed due to a shortfall, albeit marginal, in the disbursement of financing to small and micro enterprises (SMEs). While for component three, only nine capacity building training sessions were hosted, against a targeted twelve. This yielded an overall completion index of 0.95.

Was there a fall in the cost of electricity to end-users from the ESEEP? Table 8 in the Appendix summarizes the World Bank Doing Business Reports for the ease of getting electricity in Jamaica in 2018 compared to 2013. The data shows an improvement in the cost of electricity as a per cent of income per capita and an overall advancement in the ranking of obtaining electricity from 2013 to 2018. This was a relative improvement when compared to countries such as Trinidad & Tobago and Barbados which did not improve during the period. Nonetheless, the number of procedures required to obtain electricity connection deteriorated marginally and there was a decline by one day for the wait time for getting electricity connection in 2018, relative to 2013. This indicates that relative to other countries, conditions in Jamaica would have fallen in these areas. In this regard, did the reform facilitate a conducive investment climate? To achieve this, among others, the reform should support competitiveness among trading partners. Figure 9 in the Appendix shows that among Jamaica's main trading partners, the cost of electricity in Jamaica remained significantly high, which is compounded and/or influenced by the relative high loss of power transmission and distribution. This is supported by global electricity prices at September 2019, which showed Jamaica having the highest prices, excluding Barbados, see Table 9, Appendix.

The assessment shows that while most targets were met under the ESEEP, the impact although

present was not sufficient to bring about the necessary improvements that were envisaged to have a creditable impact on economic growth or provide a fillip to overall growth as the cost of electricity remains high.

Multi-Purpose Business Registration Form

With the exception of the first, the targets under the Multi-Purpose Business Registration Form programme were delayed due to insufficient funding for software and hardware upgrades, issues related to project implementation design and time spent by the Companies Office of Jamaica (COJ) to manage the amendment of the Companies Act. This resulted in yearly completion ratios of 1.0 for both 2015 and 2016, however, 0.50 and 0.40 in 2017 and 2018, respectively. Accordingly, the annual average completion index was 73 per cent. Despite this, the introduction of the super form led to a significant reduction in the timeline for registering a business from 6 days to 24 hours. According to the World Bank Doing Business Surveys, Jamaica improved by 19 places in 2018 to a rank of 75th relative to its rank in 2013 (see Table 10, Appendix). This supports the notion that the GOJ reform programme has been relatively impactful in bringing about an improvement in the local business climate.[15] In addition, as it relates to starting a business, the reports indicated that Jamaica improved its ranking by 17 places to 6th in 2018. This improvement was attributed to declines of 60.0 per cent, 50.0 per cent and 30.0 per cent in the number of procedures, wait time and cost for starting a business, respectively, in 2018 relative to 2013. Tennant (2018) also highlighted the impact of the MBRF on starting a business in Jamaica. This assessment finds that although the reform was not fully implemented, it served as a driving force towards improving the business climate in Jamaica, which could have registered greater improvement if the reforms were fully implemented.

Application Management and Data Automation System

Despite the AMANDA system being implemented in all 14 parishes and producing a completion index of 1.0, Jamaica's ranking for the ease of obtaining construction permits, as indicated by the World Bank index, deteriorated by 24 places in 2018 relative to 2013 (see Table 10, Ap-

[15] Of note, the improvement in Jamaica's business climate over the period far exceed that of its main Caribbean counterparts, but remained well below the ranks of selected developed countries.

pendix). This compares to improved rankings for Barbados, St. Lucia and Trinidad & Tobago. Jamaica's deterioration was attributable to increases in the number of days and procedures involved in the approval process for permits. The assessment finds that although the reform achieved full implementation it did not result in a relative improvement in the targeted business conditions in Jamaica. Intuitively, this means that although Jamaica sought to implement enhancing measures, they lagged behind similar measures implemented by trading partners. As a result, the reform did not have the intended impact.

Establishment of a Port Community System (PCS)

Since the completion of the PCS in late 2018, all cargo vessels to Jamaica have been reported to the Jamaica Customs Agency (JCA) by their shipping agents through the PCS. This has significantly reduced the turnaround time for the completion of transshipment bills from 30 minutes to an average of 5 minutes. End-users noted that the single data entry platform allowed for the submission of shipping manifests and other key documents to one site, which automatically distributes them to key parties in the logistics chain, therefore improving efficiency in the system. Furthermore, the World Bank Ease of Doing Business Reports for 2016 and 2019 show that since the implementation of the PCS, trading across border improved by 11 points, which facilitated the advancement in the country's placement by 12 places, to 134, among surveyed countries (see Table 5, Appendix). The improvement was seen predominantly in the time to export and time to import. Within time to export, border compliance fell by 24 hours, while document compliance for imports declined by 31 hours. On the other hand, while document compliance cost to import and export fell during the period, border compliance cost to import and export increased. Based on the above, the assessment finds that while some of the targets were met, in particular, a fall in transit times and an improvement in competitiveness, a greater impact may have been had on the business environment if the reform were fully executed. PCS recorded a completion index of 27 per cent.

5.0.2 Yearly Aggregated GESR Completion Index Results

To estimate the overall pace of reform implementation, the programme's average yearly growth enhancing reforms completion index is computed as shown in (Table 11 in the Appendix).

The programme commenced on a high note in 2013, achieving a completion index of 100.0 per cent with the achievement of the targets under the Agro Parks, ESEEP and AMANDA System reforms. However, the programme's completion rate declined to 0.98 and 0.84, respectively, in 2014 and 2015 due largely to the LAMP programme. The steady decline was maintained for the following three years, to a 51 per cent completion rate in 2018. This occured as the efficiencies within the implementation for the various reforms deteriorated. This hindered the programme's goal of providing the necessary fillip to economic growth. In aggregate, the assessment revealed that the seven growth enhancing reforms achieved an completion index of 75 per cent, as seen in Table 11. With less than full implementation, the growth enhancing reforms programme provided thousands of jobs via by the BPO industry and facilitated improvements in the business climate by the MBRF reform. However, due to the small magnitude of the projects and less than desired implementation, the reforms were incapable of engendering the needed fillip to economic growth.

5.1 Exogeneity Empirical Results

Agro-Park Implementation

To segregate the influence of other growth enhancing reforms and other exogenous shocks on growth, the exogeneity methodology appropriately tests whether the efforts use to boost agriculture domestic production and export volumes through Agro-Parks represented efficient transmission instruments that exclusively induced growth in the Jamaican economy.

A vector autoregressive model is established to ascertain the impact of Agro-Parks on real GDP growth over the reform period, March 2013 to December 2019. The model is estimated over the period March 1999 to December 2019 to account for the pre and post reform periods. Two main transmission variables are selected for this model, agriculture domestic production ($dlagrodp_t$)

and growth in traditional export volumes ($agroevg_t$). The control variables for this model are current account balance as a per cent of GDP ($cadg_t$) and real investment to real GDP ratio ($invgdp_t$). The structural break point test indicates a structural break in the September 2007 quarter, which supports the incorporation of the breakpoint dummy ($dumsept07$). The step dummy representing the timing of the Agro-Park reform is denoted by $agroreform$. The full model for the Agro-Park reform is denoted by contemporaneous and lagged terms in equation 4. The model specification test of no serial correlation, normality, heteroskedasticity as well as dynamic stability is confirmed (*see* Appendix Figure 6).

$$\text{rgrowth}_t = \alpha_0 + \pi_1 rgrowth_{t-1} + \beta_1 cadg_{t-2} + \beta_2 invgdp_{t-1} + \gamma_1 dlagrodp_t + \gamma_2 dlagrodp_{t-1} + \gamma_3 agroevg_{t-1} + \delta_1 agroreform + \delta_2 dumsept07 + \varepsilon_t \qquad (4)$$

According to Kireyev (2001), the test of exogeneity is predicated on the existence of a cointegrating relationship among the variables. This means there should exist long-term co-movements in the full model of X_t. The test of cointegration was conducted on the first order VAR as indicated by the lag length criteria (see *Appendix Figure 12*). The results associated with the Johansen cointegrating test, suggest that there exist three cointegrating relationship within the Agro-Park reform model (See Appendix Figure 12). This result provides a segue into testing the presence of weak exogeneity by estimating a restricted VAR and conducting a likelihood ratio test. This is done by placing the speed of adjustment coefficients in the α matrix to zero based on a rank of 1. The test result shows a failure to reject the null hypothesis that there is weak exogeneity and conclude that the agriculture domestic production (Z_t) is exogenous to the full model, (X_t). However, agriculture export volumes is endogenous (See Appendix B Figure 13). Intuitively, the result suggests that the government can use policy to stimulate domestic agriculture production to influence growth in the economy, however, cannot use agriculture export volumes as a policy tool to stimulate growth. However, how effective is agriculture production as a policy tool?

Conducting the test of weak exogeneity is insufficient to attest to the effectiveness or ineffectiveness of the selected transmission variables in influencing real GDP growth. As a result, a granger causality test is required to assess the effectiveness of the policy tool once exogeneity is found. The results of the granger causality test show that agriculture production does

not granger cause real GDP growth and as such is an ineffective policy tool on its own (See Appendix B Figure 13).

Business Processing and Outsourcing Implementation

The BPO industry in Jamaica has been argued to value over US$ 400 million employing thousands of individuals across several companies. This reform policy was geared towards increasing employment and hence households income, thereby inducing real output growth. The transmission variable (policy instrument) for this model is employment ($dempr_t$) growth while the control variables are the current account balance as a per cent of GDP ($cadg_t$) and real investment to real GDP ratio ($invgdp_t$). The structural break point test indicated a break in the December 2007 quarter, a motivation for the breakpoint dummy ($dumdec07$). The step dummy that represents the timing of the BPO reform is denoted by ($bporeform$) and ranges from June 2014 to March 2020. The full model for the BPO reform is represented by contemporaneous and lagged terms in equation 5. The model specification test of no serial correlation, normality, heteroskedasticity as well as dynamic stability are shown in Appendix B Figure 14. The findings from the model specification diagnostic tests suggest that the residuals are multivariate normal, no evidence of serial correlation up to the first, second or fourth lags and model stability with an optimal lag length of 1. The Johansen cointegration test suggests the existence of two cointegrating equation among the variables X_t (*Appendix B Figure 18*). With this, the test of weak exogeneity is conducted by placing the corresponding row of the speed of adjustments coefficients in the α matrix to zero.A restricted VAR was constructed and the likelihood ratio test is used to detect weak exogeneity of the BPO policy instrument Z_t.

$$\text{rgrowth}_t = \alpha_0 + \pi_1 rgrowth_{t-1} + \beta_1 cadg_{t-2} + \beta_2 invgdp_{t-1} + \gamma_1 dempr_t + \gamma_2 dempr_{t-1} + \delta_1 bporeform + \delta_2 bporeform_{t-1} + \delta_3 dumdec07 + \varepsilon_t \qquad (5)$$

The result reveals the existence of weak exogeneity and as such fails to reject the null hypothesis at the five per cent level of significance. This finding implies that business processing and outsourcing as a policy instrument (employment rate) (Z_t) is exogenous to the full model, (X_t). The detection of weak exogeneity in employment suggest that the government has full control over this policy instrument and can efficiently manipulate this tool to influence the

target variable (Y_t), real GDP (See Appendix B Figure 19).

Despite possessing the weak exogeneity property, it is necessary to test the effectiveness of the policy tool by conducting a granger causality test between the BPO transmission (*empr*) variable and real output growth (*rgrowth*). The granger causality results show a one directional empirical causality from real GDP growth to employment. Accordingly, there is a rejection of the the null hypothesis that *rgrowth* does not granger cause *empr*. This result suggests that at the 10 per cent level of significance, real GDP growth invokes a change in employment in the economy but not vice versa. Accordingly, the transmission variable is not an effective policy tool on its own (See Appendix B Figure 19).

Energy Security and Efficiency Enhancement Project Implementation

For this reform, the main transmission variables are business electricity consumption and electricity production, with the current account balance as a per cent of GDP ($cadg_t$) and real investment to real GDP ratio ($invgdp_t$) as control variables. The step dummy created for this reform is *(eseepreform)* reflecting the period in which the reform was implemented (*March 2013 - December 2017*). The results of the structural break test suggest that the December 2010 ($dumdec10$) and December 2007 ($dumdec07$) quarters represent significant breaks in the data set. The estimated model is as follows:

$$\text{rgrowth}_t = \alpha_0 + \pi_1 rgrowth_{t-1} + \beta_1 cadg_{t-2} + \beta_2 invgdp_{t-1} + \gamma_1 eseep_ep_{t-1} + \gamma_2 deseep_ies_t + \gamma_3 deseep_ies_{t-1} + \delta_1 eseepreform + \delta_2 eseepreform_{t-1} + \delta_3 dumdec07 + \delta_4 dumdec10 + \varepsilon_t \quad (6)$$

The results of the diagnostic checks are shown in Appendix B Figure 20, which suggest a statistical sound model. The Johansen cointegration test indicates the existence of one cointegrating relationship, which suggests a long run co-movement between the variables in the full model (X_t) (*Appendix B Figure 26*). The test for weak exogeneity for both business electricity consumption and energy production show that the policy instruments (Z_t) are set exogenously outside the model and are therefore efficient policy instruments. That is, the policy instruments can be used to influence output growth for Jamaica. In addition, the results from the granger causality test show that both ESEEP policy instruments significantly granger cause growth in real GDP with at least two period lag (See Appendix B Figure 27). It therefore suggests that

the ESEEP policy instruments are efficient and effective in engendering economic growth.

Land Titling Reform Implementation

For the LAMP assessment, the policy instrument (transmission variable) used is gross capital formation (investment -($landt_invest$)) while the control variable used is the current account balance as a per cent of GDP ($cadg_t$). Similar to the BPO reform, two distinct structural breaks are identified, the December 2007 ($dumdec07$) and December 2010 ($dumdec10$) quarters. The period (June 2013 - March 2020 quarter) in which the reform was implemented is denoted by ($lampreform$). The relevant diagnostic tests of the model are shown in Appendix B, Figure 28. The land titling reform VAR(3) model is as follows:

$$\text{rgrowth}_t = \alpha_0 + \pi_1 rgrowth_{t-1} + \pi_2 rgrowth_{t-2} + \pi_3 rgrowth_{t-3} + \beta_1 cadg_{t-1} + \gamma_1 llandt_invest_t + \gamma_2 llandt_invest_{t-1} + \delta_1 lampreform + \delta_2 lampreform_{t-1} + \delta_3 lampreform_{t-2} + \delta_4 dumdec07 + \delta_5 dumdec10 + \varepsilon_t \qquad (7)$$

The result of the Johansen cointegration test suggest that there are two cointegrating relationship among the variables. Detecting long run co-movement creates the foundation for testing whether weak exogeneity exist. The likelihood ratio (LR) test does not show weak exogeneity of the LAMP transmission variable ($landt_invest$). This means that the LAMP policy instrument is an inefficient policy tool that is incapable of being used by the authorities to induce real output growth in the Jamaican economy. Based on this finding, it is seen that implementation of the land titling reform during FY2013/14 and FY2019/20 has had no noticeable impact on real GDP growth evidenced by the exogeneity testing procedure.

Application Management and Data Automation System Implementation

The empirical assessment for the AMANDA reform uses the total number of housing starts ($amanda_hspioj$) as the policy instrument. The set of control variables are the current account balance as a per cent of GDP ($cadg_t$) and real investment to real GDP ratio ($invgdp_t$). Two break dates are identified for the system (September 2007 and March 2011). The period in which the AMANDA reform was implemented is denoted by ($amandareform$), that is, between March 2013 to December 2015 quarters. The AMANDA reform VAR model is as follows:

$$\text{rgrowth}_t = \alpha_0 + \pi_1 rgrowth_{t-1} + \beta_1 cadg_{t-2} + \gamma_1 dlamanda_hspioj_t + \delta_1 amandareform + \delta_2 dumsept07 + \delta_3 dummar11 + \varepsilon_t \ldots\ldots (8)$$

All the misspecification tests for the estimated VAR model are theoretically sound (see Appendix B Figure 34). The Johansen cointegration test shows the presence of one cointegrating relationship at the five per cent level of significance (Appendix B Figure 38). The LR test shows that the transmission variable is weakly exogenous. This indicates that the government can efficiently formulate policy to influence housing starts that will have an enhancing impact on economic growth. However, this policy is not effective on its own to stimualte growth as there is no empirical causality as shown in the granger causality test results (2 period lags) between the AMANDA policy instrument to real GDP growth (Appendix B, 39). This result indicates that housing starts is not an effective policy instrument to impact real output.

6 Conclusion

This paper sought to examine whether the structural adjustment programme implemented by Jamaica since 2013 was successfully completed. This was done in an attempt to determine whether the reforms facilitated added growth or provided an impetus to economic activity. The paper developed a statistical and econometric procedure to test the implementation status and effectiveness of the reforms, respectively, using a structural reform index modified from Lora (2001) and the exogeneity properties of variables in a vector error correction model. In aggregate, the assessment revealed that the seven growth enhancing reforms achieved an completion index of 75 per cent. With less than full implementation, the growth enhancing reforms programme provided thousands of jobs via by the BPO industry and facilitated improvements in the business climate. However, due to the small magnitude of the projects, less than desired implementation and ineffective management the reforms were incapable of engendering the needed fillip to economic growth. Further, the assessment showed that while all but one of the policy variables were efficient policy tools to be used to engender growth, all (with the

exception of ESEEP) were ineffective on their own to facilitate the needed fillip to growth. A a result, there were no added impetus to economic growth over the reform period, evident by a mere 0.3 percentage points improvement after the reform measures were implemented.

7 Recommendation

In accordance with the findings of this paper, it is recommended that an Economic Transformation Committee be established by the GOJ for the development and effective execution of targeted growth enhancing reforms. The duties of the committee should entail at minimum the following:

- A thorough assessment of the economic climate of the various sectors that reforms will target. This will allow reforms to be tailored to economic demands, and eliminate the likelihood of aiming to fill gaps that do not exist. For example, focusing on training persons for employment in the BPO sector when potential employees already possess entry-level qualifications.
- Dissect each implemented reform with the following questions outlined by Tennant (2018). Is the GOJ confronting the right issues? Is the GOJ using the right types of initiatives to confront these issues? Are these initiatives being implemented effectively? Is the GOJ doing enough?
- Solicit adequate funding, from the private sector and through foreign assistance, to provide the necessary resources and human capital to achieve seamless and complete execution of reforms.

Importantly and consistent with studies done on the effectiveness of GOJ projects, there is a great need to establish clearly defined procedures for the management, implementation and efficient execution of GOJ projects. Accordingly, it is recommended that a designated group of project management officials are assigned to what is coined in this paper as the 'Jamaica Projects Task Force' - JPTF.

The design of the Jamaica Projects Task Force would comprise of a team of accredited project management officers that are linked or have a wealth of experience with ministries under which each project is being operated. It is imperative that this team is an independent body and has the authority to hold responsible parties accountable for the progress of each GOJ project. For JPTF to be successful the following is required:

1. **Recruitment and Accreditation**: It is recommended that rigorous interviews and/or consultation process be done to identify the best candidate(s). This process will allow member(s) within the government with years of service to openly provide details on how they can identify and practically address the inherent project problems within their ministries as well as identify capable skillsets that exist outside of the government. During recruitment, it is recommended that the member(s) has the Project Management Professional (PMP) certification from an accredited institution.[16]

2. **Authority**: The JPTF must be armed with the necessary authority and power to hold responsible agencies accountable. Furthermore, the team will report directly to the Minster in charge of growth.

The size of JPTF will be dependent on the scope of the project which can be detailed through an executive-level consultation in a policy document dedicated to establishing these recommendations.

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[16]The Project Management Professional is the world's leading project management certification which is highly recognized and demanded by organizations around the world. This would be a mandatory requirement for a member to join the JPTF.

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9 Appendix

Figure 1: A Venn Diagram illustrating the relationship between the Structural Reforms designed to enhance Economic Growth

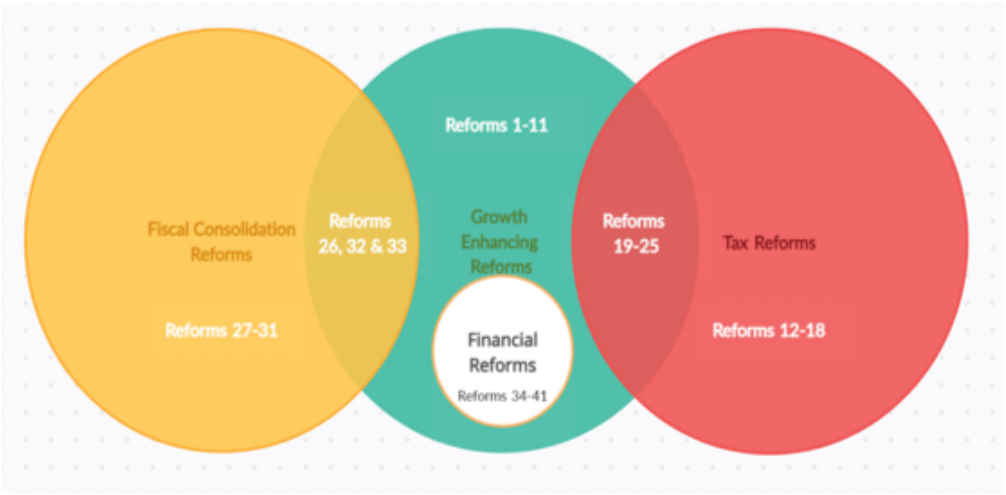


Table 1: Structural Reforms under the Government of Jamaica's Economic Reform Programme

Growth Enhancing Reforms
1. Implementation of the Application Management and Data Automation (AMANDA) System to streamline the tracking and approval of construction permits **Agency:** National Environment and Planning Agency (NEPA) With support from the World Bank, the implementation of the AMANDA system was expected to allow the government to streamline the tracking and approval process of construction permits across all parish councils in Jamaica. This automated tracking system was intended to reduce information inconsistencies, enhance accountability, increase customer satisfaction, and eliminate delays in the process of approving construction permits.
2. Creation and implementation of a manual and an Electronic Multi-Purpose Business Registration Form (BRF) to amalgamate the business registration process **Agency**: The Companies Office of Jamaica (COJ) The implementation of the multi-purpose registration instrument aims to streamline the business registration process via a "super form". This super form serves as a 'one-stop-shop' instrument that eliminates the need to visit multiple agencies when registering a business, and therefore removes any duplication across various processes. To boost efficiency and further streamline business registration procedures, an online business registration process was implemented to convert the manual business registration form to an electronic business registration form (EBRF). The EBRF allows people to register their businesses from anywhere in the world and amalgamates all the requirements and procedures from the different agencies for business start-ups. For further inclusion and convenience within the design of the project, users without internet access will be able to benefit from this 'one-stop-shop' instrument via kiosks to be deployed at selected Tax Administration Jamaica (TAJ) offices and the COJ.
3. Formulation and implementation of a five-year National Strategy to develop Jamaica's Outsourcing Industry, to take advantage of the potential economic development and benefits associated with a growing global outsourcing industry **Agency**: Jamaica Promotions Corporation (JAMPRO) This national strategic plan for the Business Process Outsourcing (BPO) industry was introduced in April 2015, with initiatives geared towards fast-tracking economic growth and job creation by leveraging the resources and expertise of all relevant industry stakeholders. Key actions under the plan included the establishment of a policy and legislative framework, labour market initiatives, infrastructure development, the development of business plans to attract developers and investors, and actions to

support market penetration. The strategy aimed to create 18,000 jobs within the next five years.

4. Introduction of a Land Titling Reform aimed at assisting landowners in acquiring the ownership certificate for their lands, and any other information regarding their lands

Agency: Land Administration & Management Programme (LAMP)

With support from the Inter-American Development Bank (IaDB), further reforms to enhance the business climate aim to expand land titling under the LAMP. The LAMP seeks to help landowners in Jamaica obtain certificates of title and update the information on existing titles.

5. Establishment of a Port Community System (PCS) to streamline exports and import processes among stakeholders

Agency: Port Authority of Jamaica

The PCS is an open collaborative platform that was launched in 2016 to electronically integrate and streamline cumbersome import-export requirements between public and private stakeholders. This was done to improve the efficiency of the Jamaican sea and airport communities in an effort to change the perception of Jamaica's trade facilitation and logistics climate in relation to major competitors in the Central American and Caribbean region.
Along with the aim to wane the net cost for trade and logistics transactions, specific objectives were to comply with standards outlined by the International PCS Association, enhance Jamaica's capacity to become a logistics hub, and aid economic growth by boosting productivity and decreasing transit times. To achieve this, the PCS was fully integrated with the Automated System for Customs Data (ASYCUDA World).

6. Introduction of a web-based system to increase the efficiency and reduce the cost of trading across borders in the form of the Automated System for Customs Data (ASYCUDA World)

Agency: Jamaica Customs Agency

The web-based system, AYSCUDA World, was introduced in 2014 to improve the efficiency and reduce the cost of trading across borders by supporting integrated procedures and the National Single Window. Its primary purpose was to help countries simplify trade by streamlining customs' administration processes and utilizing electronic documents (going paperless). The expected impact was a simpler, more transparent, and efficient process for compliant traders, which would then encourage international trade.

7. Establishment and implementation of Agro-Parks to stabilize agricultural supply

Ministry: Ministry of Industry, Commerce, Agriculture, and Fisheries

The Agro-Parks Initiative was introduced in 2013 to help establish and stabilize the agricultural supply chain, boost exports, and increase import replacement, while establishing a better relationship between the agricultural sector and the tourism industry.

8. Introduction of a Labour Market Reform to address Flexible Work Arrangements

Ministry: Ministry of Labour and Social Security

Flexible Work Arrangements were enacted in November 2014 and were expected to promulgate the improvement in the socio-economic conditions of labour, inter alia. The new legislation to introduce flexible work arrangements could benefit female employment and labour force participation. A public education campaign was also planned to promote the use of these arrangements.

9. Implementation of a Labour Market Reform Commission to address five thematic areas: Education and Training; Industrial Relations; Labour Policies and Legislation; Social Protection; and Productivity, Technology and Innovation

Ministry: Ministry of Labour and Social Security

The GOJ started to consider broader labour market reform efforts through the establishment of the Labour Market Reform Commission (LMRC), which became operational in April 2015.
In the context of the Comprehensive Labour Market Reform Agenda, the LMRC will review existing policies and practices in the aforementioned five thematic areas as one of its two targeted outputs. The second targeted output for the LMRC was to develop an Implementation Plan derived from the recommendations included in the report approved by Cabinet.

10. Implementation of an Energy Security and Efficiency Enhancement Project (ESEEP) to wane the cost of energy to the productive sector and lessen the demand for petroleum-based products

Ministry: Ministry of Science, Energy, and Technology

ESEEP was introduced in 2011 to reduce end users' energy costs in an effort to make the country more competitive, reduce the demand for petroleum-based products, and rally private sector financing. The ESEEP was structured to backbone Jamaica's National Energy Policy in achieving its goal, while consisting of three main components: strengthening the regulatory and institutional framework, improving private investment, and moving to cleaner fuels.

11. Establishment of a Net Billing Programme to achieve a low-cost generation mix of 20% renewable energy by 2030 per Jamaica's policy goal

Ministry: Ministry of Science, Energy, and Technology

In response to Jamaica's policy goal of a generation mix of 20% renewable energy by 2030, Jamaica's Net Billing Programme was introduced in May 2012. The targets of the programme included the implementation of a net billing programme for JPS customers as approved by the OUR, and the introduction of diversity in the sources of energy used for power generation, with increased utilization of indigenous resources for energy production.

Tax Reforms

12. Cessation of granting Discretionary Waivers to organizations excluding charitable organizations

Agency: Tax Administration of Jamaica
Ministry: Ministry of Finance and Public Services

The immediate cessation of discretionary waivers will see waivers only being granted when this is required to satisfy contractual or legal obligations of the GOJ. Any new discretionary waiver not in line with stated exceptions, and for which a statutory solution cannot be put in place in time, may be granted only up to a de Minimis cap (this excludes) specific discretionary waiver agreed in advance and listed in the Technical Memorandum of Understanding.

In addition, no new or renewed waiver category or other tax incentive will be approved (unless required under existing legislation) and no amendment to existing legislation which could generate further tax expenditures will be undertaken until the passage and coming into effect of the new Omnibus Incentive Law.

13. Introduction of the Omnibus Incentives Reform geared towards simplifying, streamlining, and establishing a transparent and coherent regime to govern all tax incentives

Agency: Tax Administration of Jamaica
Ministry: Ministry of Finance and Public Services

The Omnibus Incentive Regime came into effect on January 1, 2014 and had the following key objectives: the elimination of existing sector-based incentive programmes; the transition to a generally competitive business tax regime; the provision of generalized incentives for employment and capital investment; the introduction of a rules-based and non-discretionary system; the incentivization of tax compliance; and the minimization of tax-induced increases in production costs and the cost of doing business.

Agency: Tax Administration of Jamaica
Ministry: Ministry of Finance and Public Services

The relevant tax acts were last amended in October 2014. These further amendments to the relevant tax acts will: define charitable purposes; clearly define what a charity is for tax purposes; define and outline the tax treatment for donations to charities (whether in money or in kind); outline the tax treatment according to each tax type; remove ministerial discretion to grant tax waivers for charitable institutions and for charitable purposes; and outline the administrative process to be followed by the TAJ.

18. Introduction of a Charities Bill to make provision for the regulation of charitable organizations in Jamaica and for connected matters

Agency: Tax Administration of Jamaica
Ministry: Ministry of Finance and Public Services

The introduction of the charities bill was geared towards clearly identifying charitable organizations eligible for exemptions under the tax acts.

19. Cessation of granting waivers to charities other than under the Charities Bill

Agency: Tax Administration of Jamaica
Ministry: Ministry of Finance and Public Services

The termination of granting waivers to charities other than those under the Charities Bill was actioned in an effort to reduce the leakage of tax revenues to charities not included in the Bill.

20. Implementation of new rates and bands for property taxes to improve compliance and revenue collections

Agency: Tax Administration of Jamaica
Ministry: Ministry of Finance and Public Services

The new rates and bands for property taxes came into effect in June 2014, and will use land valuations from 2013 to improve compliance and revenue collections.

21. Implementation of amendments to the General Consumption Tax (GCT) Act to waive discretionary privilege for government officials and reduce leakage by broadening the tax base

Agency: Tax Administration of Jamaica
Ministry: Ministry of Finance and Public Services

The key objectives of the amendments to the GCT were to: eliminate the zero-rating of government purchases under the GCT, reduce exemptions and broaden the tax base, conduct a study by March 2014 on the scope of imposing GCT on petroleum products, and allow start-up companies to claim GCT refunds for excess credit immediately.
22. Formulation and implementation of a comprehensive overhaul of the Customs Act to streamline the processes of the Jamaica Customs Agency (JCA) through modernization, while improving international competitiveness **Agency**: Tax Administration of Jamaica **Ministry**: Ministry of Finance and Public Services Amendments to the Customs Act stipulating reductions in tariff dispersion and in the higher tariff rates, which will be capped at 20 percent in most cases, have been tabled in parliament. The comprehensive overhaul of the Customs Act aims to streamline the collection of customs taxes and fee, and improve the efficiency of customs operations. This would be accomplished through a process of modernization such as the introduction of ASYCUDA-World integrated customs software, implementation of Phase 2 of the RAiS (GENTAX) integrated tax software package, and the introduction of Phase 1 of the Enterprise Content Management (ECM) system processes, inter alia.
23. Establishment and Implementation of the Revenue Administration Information System (RAiS) to facilitate the compliance of tax payment **Agency**: Tax Administration of Jamaica **Ministry**: Ministry of Finance and Public Services RAiS is strategically aligned with TAJ's National Compliance Plan, which outlines its compliance approach in collecting taxation revenue and improving voluntary tax compliance. In doing such, amendments were made to the Revenue Administration Act to improve compliance management and permit mandatory "e-filing". Additionally, it is anticipated that RAiS will allow TAJ to better communicate with its customers and streamline the agency's operations, as most of its services are offered through the RAiS.
24. Formulation and implementation of the National Compliance Plan to further improve tax compliance and increase revenues **Agency**: Tax Administration of Jamaica **Ministry**: Ministry of Finance and Public Services The National Compliance Plan outlines the compliance approach employed by TAJ during the current fiscal year. The areas of focus include strengthening compliance and enforcement capabilities, as well as improving information, and communications

technology. The strategies outlined in the compliance plan will ensure the collection of the projected tax revenue.

25. Introduction of the Key Tax Performance Indicators to measure the effectiveness and efficiency of the tax system

Agency: Tax Administration of Jamaica
Ministry: Ministry of Finance and Public Services

The Key Tax Performance Indicator will use measures such as the new business registration form, the new consolidated income tax form for self-employed persons, and the implementation of the Revenue Administration Integrated System (RAIS), mentioned above, to measure the effectiveness and efficiency of the tax system.

Fiscal Reforms

26. Formulation and introduction of a conceptual proposal for the design of a fiscal rule

Ministry: Ministry of Finance and Public Services

The fiscal rule aims to limit the annual budgeted overall fiscal deficits of the public sector, establish an automatic correction mechanism that would be triggered by substantial cumulative deviations from the annual overall balance target, cover and take into account all fiscal activities associated with the public, and improve the effectiveness of the current enforcement and compliance regime. Authorities have presented a conceptual framework for a fiscal rule, to entrench fiscal discipline over the medium term. It is aimed at setting a floor to the annual budgeted overall fiscal balances of the wider public sector to achieve a reduction in public debt to no more than 60 percent of GDP by 2025/2026.

27. Evaluation of public sector employment and remuneration that serves to inform reform policy

Ministry: Ministry of Finance and Public Services

The review of public sector employment and remuneration is structured with the intention to review the terms of reference for technical assistance for public sector employment and remuneration. It also intends to reduce wage bill to 9 percent of GDP by March 31, 2016, support a rationalization of public sector employment, and improve the public service databases in e-Census (up-to-date record of the civil service).

28. Termination of financing to Clarendon Alumina Production (CAP) by the government or any public body

Ministry: Ministry of Finance and Public Services

Traditionally, bauxite and alumina have been two of the primary sources of goods exports for Jamaica. Nonetheless, the GOJ has commitment to refrain from any further public financial support for the state-owned Clarendon Alumina Production in light of the fiscal risks stemming from CAP's high persistent losses.

29. Revise the relevant legislation for the adoption of a fiscal rule to ensure a sustainable budgetary balance, to be incorporated in the annual budgets starting with the 2014/15 budget

Ministry: Ministry of Finance and Public Services

The revision of the relevant legislation for the adoption of a fiscal rule was to ensure a sustainable budgetary balance. To do this, the government embarked upon broad public information campaigns on the objectives of a new fiscal rule before its legal implementation. The government also developed mechanisms to closely monitor possible fiscal costs and contingencies associated with the possible Public-Private Partnership, and possible legal options for strengthening the sanctions regime to enhance the credibility of the fiscal rules, inter-alia.

30. Implementation of a top-down expenditure ceilings approach consistent with a detailed budget calendar, for the FY 2014/15

Ministry: Ministry of Finance and Public Services

The finance ministry set the overall expenditure ceiling based on various macroeconomic assumptions and fiscal management targets. Expenditure ceilings and sub-ceilings are set according to policy priorities and are usually confirmed at an early stage in the budget process.

31. Implementation of changes in legislation for the new public sector pension system

Ministry: Ministry of Finance and Public Services

The pension system for the central government will be reformed to make the system more actuarially sound and reduce pension costs to the government. The primary adjustments to the legislation for the new public sector pension system includes the retention of a Defined Benefits (DB) system and amendments to the accrual rate at which employee's benefits accumulate in the DB scheme. Additionally, pension benefits will be computed as the average of the last five annual salaries, the retirement age will gradually increase from 60 to 65 years (by one year each year) starting in April 2016, and all workers will contribute 5 percent of their salary towards their pension.

32. Introduction of a five-year public sector investment program (PSIP), beginning FY2013/14

Ministry: Ministry of Finance and Public Services

In 2013, the GOJ implemented a 5-year public sector investment programme to prioritize investment to drive economic growth. The programme's objective is to create a world-class economic and social infrastructure to enhance the delivery of public services and improve the competitiveness of the economy. The public sector investment program will be carried out under the public investment management system (PIMS) which specializes in promoting growth, and developing and encouraging capital formation for future investment.

33. Formulation and introduction of a comprehensive Public Sector Investment Program

Ministry: Ministry of Finance and Public Services

The introduction of a comprehensive Public Sector Investment Program is to increase the possibility of accomplishing the aforementioned objectives for the PSIP.

Financial Reforms

34. Establishment and implementation of a Venture Capital Programme to bridge the gaps which existed in the traditional financing options for micro, small and medium-sized enterprises (MSMEs)

Agency: Development Bank of Jamaica (DBJ)

The Jamaica Venture Capital Programme was designed to address the gaps which existed in the traditional financing options for MSMEs. Companies that are innovative in nature with high growth potential require funding from venture capital (VC) and private equity capital, as opposed to credit. As a result, the DBJ has actively pursued two projects with the intention of developing a venture capital entrepreneurial and early-stage ecosystem in Jamaica. The importance of this programme lies in the fact that an increase in financing to and support for MSMEs will also support growth.

35. Establishment and introduction of a Tourism Enhancement Fund (TEF) to improve Small Medium Enterprises within the Tourism Sector

Agency: The National Export-Import (EXIM) Bank of Jamaica

In September 2016, the EXIM Bank signed an agreement with the Tourism Enhancement Fund (TEF) for a loan of J$1.0 billion to lend at a competitively priced interest rate of 5% per annum. The loan is to qualify small and medium sized tourism enterprises within the Tourism Sector and linkage networks for raw material purchase, capital equipment

acquisition, finance infrastructure development, working capital support, and expansion of tours and attractions.
36. Establishment and implementation of an Entrepreneurship Programme (DBJ Ignite Programme) to facilitate the commercializing of the products or services of start-up micro and small enterprises (MSEs) **Agency**: The Development Bank of Jamaica (DBJ) The Development Bank of Jamaica launched the Entrepreneurship (Ignite) programme in October 2015. The amount of J$75M was allocated to undertake capacity development initiatives targeted at locally registered startup micro and small enterprises to facilitate the commercializing of their products or services. Also, in the context of the ignite programme, the DBJ partnered with several entities to act as Business Service Intermediaries (BSIs) that channeled grant funds to the entrepreneurs, provided coaching and mentorship, and project management support.
37. Establishment and implementation of a Central Collateral Registry **Ministry**: Ministry of Investment Commerce and Fisheries The establishment and implementation of a Central Collateral Registry came about out of the need to improve commerce, by expanding access to domestic credit, while minimizing the risks of loan default.
38. Implementation of a Secured Transaction Regime to facilitate the use of non-traditional collateral as a means of acceptable collateral **Ministry**: Ministry of Investment Commerce and Fisheries The secured transaction regime project seeks to facilitate the use of different types of assets that were more widely available to MSMEs, particularly movable assets (inventory and equipment), to increase loans to MSMEs and reduce the cost of borrowing.
39. Introduction of a Mobile Money Project for unbanked Jamaicans to reduce transaction costs for low-income earners by improving the access of micro-finance services through modernization **Agency**: The Development Bank of Jamaica

The Mobile Money Project for the unbanked aimed to reduce transaction costs for low-income earning Jamaicans by improving the access of micro-finance services through the introduction of a mobile money platform for such persons.

40. Implementation of an Insolvency Act designed to address and resolve legal matters of business insolvency, creating a climate conducive for investment

Ministry: Ministry of Investment Commerce and Fisheries

The Insolvency Act was designed to facilitate the implementation of legislation to create a new insolvency regime. This regime intends to provide a modern framework to individuals and businesses to resolve matters of business insolvency. Also, the regime facilitates the rehabilitation for companies on the brink of insolvency by allowing them to implement viable turnaround strategies, and preserve assets and jobs through business continuation, whilst respecting the rights of creditors.

41. Establishment and introduction of a Financial Inclusion Council to execute the cabinet-approved financial inclusion strategy for the period 2016-2020, to improve the country's financial system by 2020

Agency: Bank of Jamaica
Ministry: Ministry of Finance and Public Services

The GOJ, along with commenting agencies, has crafted a National Financial Inclusion Strategy (NFIS), which aims to improve the country's financial system by 2020. The goal of the NFIS is to create conditions for which Jamaicans, particularly those who were previously underserved by the domestic financial system, are able to save safely and build up resilience against financial shocks. The NFIS also seeks to ensure that firms are able to invest, grow, and generate greater levels of wealth.

Table 2: Average Pre & Post-Reform Growth Rate (%) by Industries

Industry	*Pre-Reform FY00/01 - FY12/13*	*Post-Reform FY13/14 - FY19/20*
Agriculture, Forestry & Fishing	0.6	2.6
Mining & Quarrying	(2.4)	1.8
Manufacture	(1.2)	1.2
Electricity & Water Supply	1.1	0.7
Construction	(0.2)	1.2
Wholesale & Retail Trade	0.1	0.5
Hotels & Restaurants	2.9	2.2
Transport, Storage & Communication	1.3	0.8
Finance & Insurance Services	2.5	1.2
Real Estate, Renting & Business Activities	0.9	0.6
Producers of Government Services	0.4	(0.0)
Other Services	1.7	1.1
Financial Intermediation Services	(0.7)	1.2
Total Value Added @ Basic Prices	**0.6**	**0.9**

Table 3: Structural Reform Information, Implementation Targets and Implementation Periods

Reform	Timing	Legislative Actions	Implementation Status [1]	Agencies
(1) The introduction of a Land Titling Reform by LAMP aimed at assisting landowners with obtaining information and ownership certificates for their lands. **Targets**: i. LAMP was expected to issue 1,000 new titles during FY2014/2015. ➢ 851 new titles were issued during 2014/15 – **Below Target** ii. LAMP services were expected to expand to the parishes of St. James, Trelawny and Hanover in FY2015/16. ➢ LAMP services were expanded to St. James, Trelawny, Hanover, St. Ann and Westmoreland in FY2015/16 – **Target MET and exceeded** iii. During FY2015/16, an additional 2,500 titles were expected to be issued. ➢ Only 1,236 titles were issued – **Below Target** **Impact Assessment –** Not Impactful as at FY2015/2016 **Justification**: Though the programme saw success in expanding to Trelawny, Hanover, St. Ann and Westmoreland, as planned, targets relating to the issuing of land titles were not met. The executing agency should explore the option of greater public sensitization. Also, investment opportunities are often foregone because lands cannot be used as collateral for loans without the title. Of note, more recent data is needed to give an updated impact assessment of the programme.	March 2015	N/A	Met	NLA, LAMP

[1] Implementation Status: Met – Implementation completed within the stipulated time, Met with delay - Implementation completed but not within the stipulated time, Uncertain – the Initiative is in operation but the completion status is questionable or unknown. Of note, some implementation status would have been obtained from credible source such as the IMF country report document and was taken as given.

Reform	Timing	Legislative Actions	Implementation Status	Agencies
(2) JAMPRO formulated and implemented a Business Process Outsourcing (BPO) Industry Reform through a Five Year National Strategy to develop Jamaica's Outsourcing Industry for Jamaica to take advantage of the potential economic benefits of a growing global outsourcing industry. The strategy was implemented by JAMPRO and had **four key components**: 1. Developing the policy and incentive framework for the industry by enacting the Special Economic Zone Act and Regulations. This provided clarity on tax and other cost implications, ensuring that outsourcing activities were included in the Income Tax Relief (Large Projects and Pioneering Industries) Act of 2013, passing Data Protection Laws, and facilitating access to working capital for local outsourcing companies 2. To improve the labour pool through training at middle management levels, finishing schools and apprenticeships, training incentives (tax credits to companies offering training to their staff), and development of a National Training Strategy 3. Infrastructure development, specifically the Naggo Head Technology Park, and fostering competitive electricity rates ➢ Information surrounding the date construction will commence on Naggo Head Technology Park has not been obtained at the time of reporting. However, the project was approved by the cabinet in September 2018 to develop the 34 acres facility and is expected to span over 2 years. 4. Improve market penetration by contracting an in-market broker for ICT, execution of consistent and sustained marketing campaigns, and more impactful participation in international trade shows. Avasant Consulting was contracted in January 2017 (in-market broker for ICT). **Job targets** set under this reform are as follows:	End-June 2015 – December 2018	**3(i) Legislation Name:** Special Economic Zone Act and Regulations Act 2016 **Action required:** Enactment of Act & Regulation. - Enacted on February 15, 2016 **Current status:** Process completed - Bill is now a law as at August 1, 2016 **3(ii) Legislation Name:** Data Protection Act 2017 **Action required:** Drafting and Enactment **Current status:** Bill was brought to Parliament in early October 2017 and was subsequently being reviewed by a Joint Select Committee. However, the bill was delayed for nearly two years following the Petrojam scandal, and was subsequently passed on May 20, 2020.	Uncertain	MIIC /JAMPRO

i. 19, 200 new jobs for the BPO industry by March 2017 ➢ **Target surpassed** as 22,000 jobs were added as of that date ii. 23, 500 jobs by March 2018 ➢ **Target surpassed** as 33,000 jobs were created as of that date **Training targets** under this reform are as follows: i. 2,100 persons to be trained and certified in the HEART's Customer Engagement Programme by end-September 2017. ➢ Only 450 persons were trained as at that date – **Below Target** ii. 50, 000 persons trained by March 2020 **Challenges** faced during implementation included: 1. Recruiting trainees 2. Slower than anticipated pace of training **Impact Assessment –** Impactful to some extent thus far **Justification***:* The Five-Year National Strategy for the development of Jamaica's Outsourcing Industry managed to create a climate to increase employment, surpassing all the job creation targets outlined. The reduction in unemployment is crucial to achieving viable sustainable economic growth. The downside to the programme was that it failed to meet the certification and training target through HEART's Customer Engagement Programme at the end of September 2017. In addition, the programme is on target to miss the march 2020 training and certification target of 50, 000 persons. Lastly, more information is needed as it relates to the full implementation of the key component as they set the platform for the initiative and achieve targets.		**3(iii) Legislation Name:** Income Tax Relief (Large Projects & Pioneering Industries) Act, 2013 **Action required:** Amendment to include outsourcing activities **Current status:** Uncertain		

Reform	Timing	Legislative Actions	Implementation Status	Agencies
(3) The Ministry of Industry, Commerce, Agriculture, and Fisheries supported by various commenting agencies established and implemented Agro Parks in and around Jamaica. The Agro Parks Initiative aimed to stabilize the agricultural supply chain, boost exports, and increase import substitution, whilst establishing better links between the agricultural sector and the tourism industry, which is considered a priority and is actively supported by the Tourism Linkages Council. As of FY2014/15, nine (9) agro parks are already operational. Negotiations are ongoing to establish at least five more parks in 2015/16, with the IDB under solicitation to support at least two new Agro Parks. A sustainability framework for the existing Agro Parks and selection criteria for new Parks was completed by IDB-financed consultancy, and results presented to relevant stakeholders in September 2015. **Impact Assessment** – Expected to be impactful but more information needed from the executing agencies to do an impact assessment	Continuous		Met	IDB/ MICAF

Reform	Timing	Legislative Actions	Implementation Status	Agencies
(4) The Ministry of Science, Energy, and Technology implemented the Energy Security and Efficiency Enhancement Project (ESEEP) to reduce the cost of energy to the productive sector and lessen the demand petroleum-based products. The ESEEP consisted of **three** main components: 1) Improve sector performance by making the regulatory and institutional framework stronger, improving private investment, and moving to cleaner fuels. **Targets**: i. 12 new sector regulations under preparation or approved ➢ The sector regulation target was exceeded with 17 new sector regulations receiving approval. ii. To obtain a new generating capacity 267 Megawatt of tendered, negotiated or under construction ➢ The new generating capacity target of 267 Megawatt was surpassed significantly to obtain a new generating capacity of 614 MegaWatt. iii. Milestones in the implementation of the natural gas/LNG programme ➢ The milestone to implement natural gas was accomplished with the construction of the Bogue and Old Harbour Bay LNG import and regasification facilities. iv. Implementation of 18 activities under the information/communication plan ➢ The communication programme was launched to raise public awareness of the National Energy Policy goals. However, it is uncertain as to whether all 18 targeted activities under the programme were implemented. **All the targets outlined under component one were achieved**.	May 2011- June 2015	**Name of Legislation:** The Electricity Act, 2015 **Action Required:** Enactment of the Act **Current Status:** Process completed - Bill is now a law	Met with delay - October 31, 2017	MSET

2) Develop energy efficiency and renewable energy potential **Targets:** i. Increase the energy efficiency testing (testing 250 electrical appliances) and labeling capability of the Bureau of Standards, and hold education campaign on efficient electrical appliances ➢ There was no increase in energy efficient testing as no appliances were tested because of delays in the project implementation. Nonetheless, educational sessions on efficient electrical appliances were held in Kingston and Montego Bay. ii. Conduct 10 pre-feasibility and feasibility investment studies for identified small hydro sites ➢ 11 pre-feasibility and 10 feasibility investment studies were conducted. iii. To provide a line of credit/revolving facility through the DBJ to approved financial institutions (AFIs) to provide the private sector with retail financing for energy efficiency and renewable energy investments (with targeted disbursements under the SME line of credit of USD $5.6m and for the electricity sector of USD $625m). ➢ The targeted disbursements under the SME line of credit of USD$5.6m exceeded the actual disbursement of USD $5.38m due to insufficient fiscal space. The level of financial commitment and expenditure for the electricity sector has amounted to USD$809m, exceeding the target by USD $184m. All targets were met, with the exception of the first targeted outcomes due to delays in project implementation. Also, the disbursement under the SME line of credit was marginally below target. 3) Strengthen the capacity of MSET for project management, procurement, and financial management, as well as for monitoring and evaluation of actions under the National Energy Policy.				

Targets: i. Assign key people for project implementation ➢ Various key personnel such as a project manager, financial management specialist, and procurement officer have been assigned to project implementation. ii. Host 12 capacity building training sessions ➢ 75% of the targeted capacity building training sessions .were hosted iii. Prepare 12 reports regarding financial management, procurement, environmental safeguards and project audits. ➢ A total of 19 reports relating to financial management, procurement, environmental safeguards, and project audits, were prepared. This is 7 reports more than targeted. Notwithstanding the fact that only nine capacity building training sessions were hosted, all outcomes were met or exceeded. Challenges that affected the implementation of the project were: 1. The integration of modern power sector planning instruments for MSET was the only major task related to the project that was not completed within the expected time because the inputs required by the consultant were not received in time. 2. Lack of funding. 3. Absence of a project manager and project coordinator for an extended period. **Impact Assessment** - Very impactful **Justification**: All targeted outcomes were met and exceeded, except under component 3, which was largely achieved. They will contribute to improving sector performance, improving private investment, moving to cleaner fuels, developing energy efficiency and renewable energy potential, strengthening the capacity of the MSET for project management, procurement, and financial management, as well as for monitoring and evaluation of actions under the National Energy Policy. The amalgamation of these positive impacts will lead to significant growth in the energy sector, reduced energy cost to end-users, and improve investment climate, especially for energy-intensive businesses inter alia.				

Reform	Timing	Legislative Actions	Implementation Status	Agencies
(5) The Companies Office of Jamaica (COJ) created and implemented a manual Multi-Purpose Registration Business Form & an Electronic Business Registration Form to amalgamate the process required to start a business. **Targets:** i. A review of business registration processes and recommendations to optimize these processes ➢ The review of business registration processes was done and recommendations to optimize these processes were made. ii. The design and development of the business name reservation function for five business and company registration types. ➢ The Business Reservation and Business Registration (Sole Proprietor) modules were developed. ➢ All other modules are being developed, with the developer requiring an estimated four additional months for completion. iii. The implementation of kiosks in four tax offices. In addition, the management of the training and communication activities as it relates to the EBRF. ➢ The work in each of these areas has begun, however none were completed as of November 2018. The anticipated impact of the EBRF included: (a) A significant reduction in business registration time (b) Improve compliance with the statutory requirements for operating a company/business name (c) Improve Jamaica's ranking on the World Bank's Doing Business Survey. ➢ **Anticipated impact achieved**. Jamaica's ranking on the World Bank's Doing Business Survey has improved 3 places from 9th since the EBRF was initiated in July 2015 to 6th position as at the time of reporting.	July 2015-June 2018	**Legislation Name:** The Companies Act **Action required:** Amendment to the Act **Current status:** Bill is completed. Took effect June 21, 2017	Uncertain, with one of three components completed.	COJ

The project faced several different challenges resulting in implementation delays. These include: ➢ not enough requisite number of developers ➢ team members often did not possess the required skill sets ➢ capacity constraints as it relates to office space ➢ the funding provided by the IDB for software and hardware upgrades was insufficient ➢ the project implementation design was flawed in several areas ➢ time spent by the COJ to manage the amendment of the Companies Act **Impact assessment** – Potentially impactful **Justification**: More information and clarity is needed from the executing agency as it relates to the completion of the project components and the outcome of their anticipated impact, in order to give a precise impact analysis of the EBRF. However, the anticipated significant reduction in time to register a business has increased compliance, which should lead to greater revenue collection; therefore improving the fiscal space. The improvement in Jamaica's ranking on the World Bank's Doing Business Survey is the reason the programme is considered to be potentially impactful. Also, if all these anticipated impacts are met, it will increase investors' confidence in Jamaica which should boost economic growth.				

Reform	Timing	Legislative Actions	Implementation Status	Agencies
(6) NEPA along with commenting agencies implemented the Application Management and Data Automation (AMANDA) System to streamline the tracking and approval of construction permits. The Local Authorities (LAs) have integrated a Development Application Help Desk into the AMANDA software to ensure that applications are completed in full and filled out correctly before being entered into the AMANDA database. Once the applications have been logged into the system, an acceptance letter and unique reference number will be generated and sent to the applicant. In addition, the Development Application will outline each task, as well as the responsible persons and completion timeline. It will also prompt individuals when it is their time to complete a task. As it relates to transparency, applicants can view the status of their application via any web portal. **Targets**: The system was anticipated to be implemented in all parish councils by December 2014 and fully operational by June 2015. In addition, the fee structure for application fees was to be revised and standardized through a Concept Paper. The revised fee structure was expected to be implemented by December 2015. ➢ As of September 2015, AMANDA has been implemented in all 14 parishes and all relevant commenting agencies.[2] ➢ The developers of the AMANDA, California Surveying & Drafting Supply (CSDS Inc), conducted software training in July 2013 ➢ Ten (10) IT developers and 30 end-users from the Ministry of Local Government & Community Development (MLG&CD), Local Authorities and commenting agencies that have already been using the AMANDA system, will be trained and certified **Impact Assessment**- Has the potential to be impactful. **Justification***:* This reform can significantly boost the construction industry and investors' confidence in the procurement process.	December 30, 2014 - June 2015	None	Met	PCJ, NEPA, MLGCD

[2] National Works Agency, Mines and Geology Division, Agricultural Land Management Division, and the Environmental Health Unit Kingston

Reform	Timing	Legislative Actions	Implementation Status	Agencies
(7) The Port Authority of Jamaica (PAJ) established the Port Community System, which is an electronic platform used to streamline exports and import processes among stakeholders. The PCS was fully integrated with the ASYCUDA World system. Functions of the PCS that could not be offered through ASYCUDA will be pursued by the private sector, possibly under a management contract. The PCS was launched by the Port Authority of Jamaica in January 2016 and should be completed by November 2018. **The project was designed to proceed in four phases (Targets).** i. Launch of Transshipment Module (Kingston and Other Ports) ➢ As of November 2018, the transshipment Module was fully launched in Kingston and Montego Bay. This allowed shipping agents to submit their manifest in its native format to the Jamaica Customs Agency via the PCS. Also, the entire transshipment process is fully electronic and the Kingston Freeport Terminal and Kingston Wharves Limited (Terminal Operators) are now using the PCS to verify transfer authorization. It was noted by stakeholders that time, expenses and human resources needed to complete tasks have improved ii. Launch of Import Module (Kingston and Other Ports) ➢ As of October 2017, the Import Module was launched and training had started for the Port Community in Kingston iii. Launch of Export Module (Kingston and Other Ports) ➢ As of October 22, 2019, the Export Module was launched and is expected to provide members of the port community with improved productivity when dealing with their exports. iv. Launch of Import and Export Modules (Airport Community)	January 2016 – November 2018	**Name of Legislation:** The Port Authority (Port Management and Security) (Amendment) Regulations, 2015 **Action Required:** Amendment to the Regulations **Current Status:** Process completed	Uncertain	JCA, PAJ

Since the launch of the PCS to July 2018, more than 300 companies have participated in PCS-related training sessions and have gained from the streamlining of several shipping processes. Also, all cargo vessels to Jamaica have been reported by shipping agents to the JCA through the PCS. This has decreased the turnaround time for the completion of trans-shipment bills from 30 minutes to an average of five minutes. Of note, it was highlighted that end-users were content with the single data entry platform as it allows for the submission of shipping manifests and other key documents to one site; which automatically distributes them to the key parties in the logistics chain. **Impact Assessment** – Impactful **Justification**: Although stakeholders highlighted that time, expenses and human resources needed to complete tasks have improved, which was the basis for the project being considered impactful, more information is needed on the outcome of the objectives and targets 2, 3, and 4 to make a meaningful assessment.				

Financial Reforms				
Reform	**Timing**	**Legislative Actions**	**Implementation Status**	**Agencies**
(8) The Development Bank of Jamaica established a Venture Capital Programme to bridge the gaps which existed in the traditional financing options to MSMEs. Companies that are innovative in nature with high growth potential require funding from venture capital (VC) and private equity capital, as opposed to credit. As a result, the DBJ has actively pursued two projects with the intention of developing a venture capital entrepreneurial and early-stage ecosystem in Jamaica. The first project targeted the development of an ecosystem to foster the creation of a viable VC industry and was carried out between February 2013 and September 2015. **Targets** outlined under the first project: i. Create a Thorough Market Analysis Report ➢ The Market report analysis for the VC capital industry was created and took a comprehensive approach in the analysis – **Target Met** ii. Construction and implementation of a Strategic Plan to address ecosystem gaps ➢ The thorough strategic plan was developed and included a review of the legal, regulatory, and tax environment in Jamaica and the development of a standardized set of documents to strengthen the VC industry – **Target Met** iii. Development of Communications Plan ➢ In developing the communication plan[3] to achieve its target the following was realized: Two VC conferences were hosted, numerous training workshops were conducted, The National Business Model Competition was introduced, an Investor Panel of both public and private sector investors was created, and a call for proposals for fund managers interested in	1st Project February 2013-September 2015	**Name of Legislation:** Income Tax Act **Action Required:** Amendment to the Act **Current Status:**	Met	DBJ

[3] Three venture capital conference held with more than 1200 participants in September 2013, September 2014 and from March 7-9, 2016; 2 executive training workshop were held between June 30 – July 5, 2014, two legal forums; Two training workshops for policy/decision-makers, and angel investors; Two workshops held for Entrepreneurs who developed the National Business Model Competition. Also, the number of universities participating in the NBMC is likely to increase over the short to medium period as more universities sign on initiative.

investing in Jamaican businesses were issued – **Target Met** **Impact Assessment**: Impactful to a large extent **Justification**: This project was assessed as being impactful to a large extent[4]. In an effort to build on the aforementioned accomplishments by the VC industry, the DBJ implemented a second project to support the growth of high impact SMEs in the private sector, by fostering a vibrant venture capital ecosystem to improve financial access to high growth potential SMEs. **To achieve this objective*:*** The project looks to alter the posture of the beneficiaries. In particular, increase risk tolerance on the part of investors to support high impact start-ups, and on the part of entrepreneurs, higher acceptance of equity investment as an important source of funds. **The key project components include (over the next three years after September 2015)**: 1. Stakeholder training and awareness building 2. Creating a deal flow of investment-ready entrepreneurs 3. Promoting equity financing as a funding option 4. Development and implementation of knowledge management and communication strategy 5. Legal, Regulatory, Taxation framework **Impact Assessment**: Impactful to a large extent **Justification**: This project was assessed as being impactful to a large extent because "234 jobs having been created, 21 firms receiving early stage funding, 250 persons attending private equity/VC conferences, 287 stakeholders being trained, 3 venture funds launched, 64 firms benefitting from capacity development, 3 university incubators receiving capacity building to deliver effective training, and Jamaica's score on the Latin American Venture Capital Association scorecard increasing from 46 to 51 in a two-year period"				

[4] At a minimum, two VC funds were launched; 770 SMEs received training and capacity building; 30 SMEs were guided to the stage of investment-ready; VC funded five SMEs. Also,

Reform	Timing	Legislative Actions	Implementation Status	Agencies
(9) The Development Bank of Jamaica established and actioned an Entrepreneurship (DBJ Ignite Programme) Programme to facilitate the commercializing of the products and services of startup micro and small enterprises (MSEs). The Development Bank of Jamaica (DBJ) launched the Entrepreneurship (IGNITE) Programme on October 21, 2015. The amount of J$75M was allocated to undertake capacity development initiatives targeted at locally registered startup micro and small enterprises (MSEs) to facilitate the commercializing of their products or services. The DBJ partnered with several entities to act as Business Service Intermediaries (BSIs) that channeled grant funds to the entrepreneurs, provided coaching and mentorship, and project management support. **Targets:** i. Support 30 SME's ➢ The target of supporting 30 SME's was not achieved with the programme having only 27 SME's participating. ii. Distribute grants totaling a value of J$72m among participants for projects. ➢ Only J$51m of J$72m devoted to the programe for projects was utilized by the participant. This was approximately 27 % less than the target. iii. Help 12 projects progress to commercialization[5] stage during the implementation phase. ➢ As of November 2018, 4 projects were at the commercialized stage. iv. Support 3 business development trainings ➢ The programme achieved 2 out of the 3 business development trainings. v. Having MSME complete 100% of their milestones during programme. ➢ As it relates to helping MSME completing 100% of their milestones, the programme did not perform well. Only 40% of the milestones were achieved which is substantially below the target.	October 2015	**N/A**	Uncertain	**DBJ**

[5] Of note, the project progression has six stages. The stages are : (i) Idea; (ii) Testing; (iii) Prototype development; (iv) Market testing; (v) Product development; and (vi) Commercialization

vi. Have 50% of companies still in operation after the programme **Impact Assessment**: Impactful **Justification**: Although all the targets were not met, the DBJ ignite programme was considered impactful. This strategic initiative has stimulated economic growth and spurred job[6] creation. Also, all 27 beneficiaries indicated that their participation in the programme has increased their business knowledge, created valuable networking opportunities, fostered expansion into new markets, and notably increased revenues. Nonetheless, the programme could have been more impactful if all the outlined targets were met.				

Reform	Timing	Legislative Actions	Implementation Status	Agencies
(10) The Government Established and implemented a Central Collateral Registry to improve commerce, by expanding access to domestic credit, while minimizing the risks of loan default	Dec 31, 2013	**Name of Legislation:** Security Interests in Personal Property Act, 2013 **Action Required:** Enactment (2013) **Current Status :** Bill is now a law.	Met	MOFPs

[6] 310 full and part-time jobs created, accessed over $127 million in DBJ financed loans, and facilitated $389 million in total investments. Also, 11 export projects were done, 36 export markets penetrated and $218 million in revenues earned (local and export),

Reform	Timing	Legislative Actions	Implementation Status	Agencies
(11) ***The Ministry of Industry, Commerce, Agriculture and Fisheries (MICAF) implemented a Secured Transaction Regime to facilitate the use of non-traditional collateral as a means of acceptable collateral*** The secured transaction regime project came about out of the need to create a mechanism for facilitating the use of different types of assets that were more widely available to MSMEs, particularly movable assets (inventory and equipment) to increase loans to MSMEs and reduce the cost of borrowing. **Targets:** i. Enactment of the SIPP Act ➢ The Security Interests in Personal Property Act (SIPPA) was enacted in 2013. This will ease the restriction on access to credit caused by the traditional collateral requirements of financial institutions. – **Target Met** ii. Creation of a collateral registry ➢ The collateral registry was created in 2014 and was operational. It is known as the National Security Interest in Personal Property Registry of Jamaica. – **Target Met** iv. Increase the use of non-traditional collateral ➢ The increased use for non-traditional collateral was minuscule as it was hampered by the valuation of collateral and the lack of public sensitization. Of note, irrespective of the institutional framework being in place, non-traditional use of collateral still faced challenges such as: • the valuation of collateral • the high-priced stamp duty • the cumbersome un-integrated process • the supply-side private sector players having not adapted to the new process The review (October 2017) of SIPPA conducted should see new guidelines being implemented to deal with the use of non-traditional collateral. Also, for SIPPA to achieve efficacy, it was recommended that there was additional public sensitization efforts.	2014 - 2018	**Name of Legislation:** Security Interests in Personal Property Act, 2013 **Action Required:** Enactment (2013) **Current Status:** Bill is now a law.	Uncertain	MICAF

Impact Assessment – Impactful to a small extent **Justification**: Although 2 of the 3 targets were accomplished, this programme was viewed as having a small-scale impact as the increased use of non-traditional collateral was minuscule. It was hampered by the valuation of collateral and the lack of public sensitization. With the limited use of non-traditional collateral, investment opportunity or finance for investment opportunity could be extremely difficult inducing a slow in investment, therein affecting economic growth.				

Reform	Timing	Legislative Actions	Implementation Status	Agencies
(12) The Ministry of Industry, Commerce, Agriculture and Fisheries (MICAF) introduced the Insolvency Act which was designed to address and resolve legal matters of business insolvency creating a climate conducive for investment. The Insolvency Act was designed to facilitate the implementation of a legislation to create a new insolvency regime. The regime intended to provide a modern framework to individuals/businesses to resolve matters of business insolvency. The regime facilitates the rehabilitation for companies on the brink of insolvency by allowing them to implement viable turnaround strategies, and preserve assets and jobs through business continuation, whilst respecting the rights of creditors. It was noted that the insolvency regime was crucial to fostering an economic atmosphere in which entrepreneurs would not be condemned for taking risks and left without solutions if a business should fail. **Targets:** i. The enactment of the Insolvency Act in January 2015, along with the associated regulations and rules ii. Formation of the Office of the Supervisor of Insolvency All targets were met and the project implementation of the regime was completed. **Impact Assessment** - Impactful to a small extent as of 2018. (could be more impactful with greater public sensitization of the role of the regime) **Justification***:* The insolvency regime is crucial in fostering economic growth as it boosts entrepreneurs' confidence to invest more, knowing they have support from the Office of the Supervisor of Insolvency in the case of any eventualities. Nonetheless, persons were often unaware of the Office of the Supervisor of Insolvency and the role that it played in rehabilitation, as there had been very few applications for rehabilitation at the time of reporting. However, it was stated that plans were in place for JAMPRO to assist with the public education programme.	Not specified. However, *Legislation Enacted January 2015	**Name of Legislation :** The Insolvency Act, 2014 **Action Required:** Enactment (January 2015) **Current Status :** Process completed. Bill is now a law.	Met	MICAF

Reform	Timing	Legislative Actions	Implementation Status	Agencies
(13) ***The establishment of a Financial Inclusion Council to execute the Cabinet-approved umbrella financial inclusion strategy for the period 2016-2020 to improve the country's financial system by 2020***. The Government has crafted a National Financial Inclusion Strategy (NFIS), which aims to improve the country's financial system by 2020. The goal of the NFIS is to create the conditions in which Jamaicans, particularly those who were previously underserved by the domestic financial system, are able to save safely and build up resilience against financial shocks. It also aims to provide the environment where firms are able to invest, grow and generate greater levels of wealth. There are 53 action items under the National Financial Inclusion Strategy carried out by 16 ministries, departments and agencies (MDAs) in the public sector as well as members in the private sector and non-governmental organizations. The National Financial Inclusion Strategy has four pillars: (1) Financial Access and Usage – to encourage access to and usage of electronic transaction instruments (2) Financial Resilience – to promote the development and use of appropriate savings, insurance, and retirement products, particularly for vulnerable segments of the population (3) Financing for Growth – to encourage the development and use of credit and financing instruments that support economic growth (4) Responsible Finance – to ensure that all consumers of financial services are adequately educated, protected, informed, fairly treated, and able to resolve conflicts in an effective and cost-efficient manner To track the performance of the programme, a National Monitor And Evaluation Framework for financial inclusion was developed. This framework had 11 impact indicators all subdivided under the four pillar heading.	March 31, 2017	**N/A**	Met	BOJ/ MOFPs

Impact Assessment- expected to be impactful on a large scale **Justification**: Although data is needed to conduct an impact assessment, once the targets for the programme are met, the initiative will be impactful as it will create financing options for people and investors that were not readily available before. This will foster greater investment and by extension, economic growth. In addition, this initiative should improve the accessibility to money all over the island.				

Table 4: Growth Enhancing Reforms and Completion Indicators

Growth Enhancing Reforms	Outturn	Sources
Land Titling (LAMP)	Number of Land Titles Issued	International Monetary Fund (IMF) & National Land Agency
Business Process Outsourcing (BPO)	Number of Jobs Created	IMF & Jamaica Productions Corporation (JAMPRO)
Agro Parks Implementation	Agricultural Output ('000 Kg)	IMF, BOJ Real Sector & Ministry of Industry, Commerce, Agriculture and Fisheries
Energy Sector Efficiency and Expansion Programme (ESEEP)	Number of Targets met, Generating Capacity Achieved & Expenditure on Electricity Sector	IMF & Ministry of Science, Energy, and Technology (MSET)
Multi-Purpose Business Registration Form (MBRF)	Number of Targets Met	IMF & Companies Office of Jamaica (COJ)
Application Management and Data Automation (AMANDA) System	Number of Targets Met	IMF, Ministry of Local Government and Community Development & National Environment and Planning Agency (NEPA)
Port Community System (PCS)	Number of Targets Met	IMF, Jamaica Customs Agency & Port Authority of Jamaica

Table 5: Empirical Model Variables - Test of Exogeneity

Test of Exogeneity Data Set				
Variables	**Variable Names**	**Variable Description**	**Unit of Measurement**	**Source**
Target Variable	realGDP	Quarterly Real Value Added - Total Value Added at Basic Prices	JA$ millions	All Sectors New (STATIN reported values)
Control Variable 1	Current Account Balance as a per cent of GDP	Current Account Balance /Nominal GDP (US$ millions)	US$ millions (%)	Balance of Payment
Control Variable 2	Real Investment as a per cent of GDP	Gross Capital Formation /Nominal GDP (JA$ millions)	JA$ millions (%)	STATIN & BOJ
TRANSMISSION VARIABLES (POLICY INSTRUMENTS)				
Business Process Outsourcing (BPO) Reform	tlemp	Total Employed Labour Force	levels	Long Series (Labour Data)-STATIN
Land Titling Reform (LAMP)	LandT_Invest	Gross Capital Formation	JA$ millions	INVESTMENT file (EXPENDITURE BASED GDP 2007 FROM STATIN + Real Sector estimates)
Agro-Park Reform	AgroP_DP	Ministry of Agriculture (tonnes) ALL-ISLAND ESTIMATES OF CROP PRODUCTION BY QUARTER	tonnes	Agriculture File (Real Sector) Base source Ministry of Agriculture, PIOJ etc
	AgroP_EV	Total Export Volumes (tonnes)	tonnes	
Energy Security and Efficiency Enhancement Project (ESEEP)	ESEEP_IES	Industrial Electricity Sales	thousands MwH	Electricity File (Real Sector), Base source JPS
	ESEEP_EP	Electricity Production		
Application Management & Data Automation System	AMANDA_HSPIOJ	Housing starts total-nht, pioj)	levels	Planning Institute of Jamaica (PIOJ)/Centralized Management Database System

Table 6: Testing for Stationarity of Model Variables

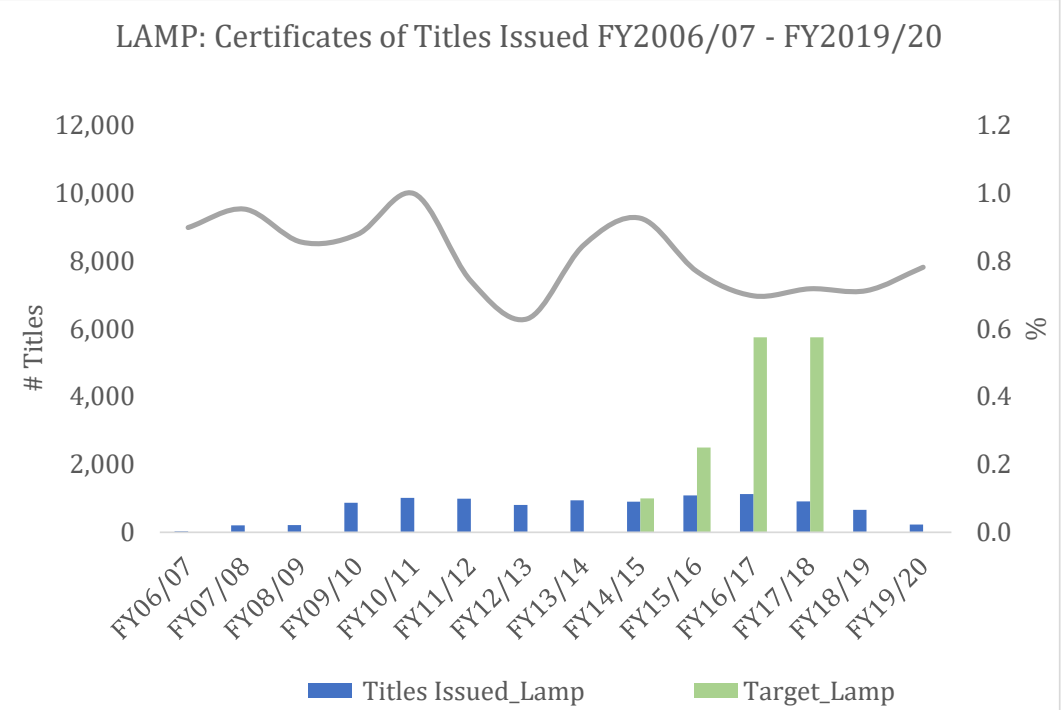
Seasonally Adjusted (STL Decomposition) variables in levels (some transformed into natural logarithm): March 1998 – December 2019 quarter			
Model Variables	**ADF[a]**	**PP[a]**	**Remark: Order of Integration**
Real GDP (**Target Variable**)	-3.176639*	-3.176639*	I(0)
Current Account Balance as a per cent of GDP (**Control Variable 1**)	-3.490262**	-3.254902*	I(0)
Real Investment as a per cent of GDP (**Control Variable 2**)	-5.488168***	-5.739922***	I(0)
GROWTH REFORMS TRANSMISSION VARIABLES (POLICY INSTRUMENTS)			
Total Employed Labour Force (**BPO)**	-1.489186	-1.267036	I(1)
Land Titling (Investment) (**LAMP**)	-4.336731***	-4.169973***	I(0)
Domestic crop production(tonnes) **(AGRO-PARKS)**	-4.291386***	-4.317566***	I(0)
Total Export Volumes (tonnes) **(AGRO-PARKS)**	-8.839473***	-11.23292***	I(0)
Industrial Electricity Sales (**ESEEP**)	-2.579766	-2.787566	I(1)
Electricity Production (**ESEEP**)	-8.463700***	-10.38572***	I(0)
Housing starts total (**AMANDA**)	-0.078040	-1.778520	I(1)
Seasonally Adjusted (STL Decomposition) variables in levels (some transformed into natural logarithm): March 1998 – December 2019 quarter			
Model Variables	**ADF[b]**	**PP[b]**	**Remark: Order of Integration**
Real GDP (**Target Variable**)	-3.159442**	-3.159442**	I(0)
Current Account Balance as a per cent of GDP (**Control Variable 1**)	-3.292636**	-3.042618**	I(0)
Real Investment as a per cent of GDP (**Control Variable 2**)	-1.609089	-3.168978**	I(0)
GROWTH REFORMS TRANSMISSION VARIABLES (POLICY INSTRUMENTS)			
Total Employed Labour Force (**BPO)**	-1.093615	-0.822128	I(1)
Land Titling (Investment) (**LAMP**)	-2.503552	-3.492059**	I(0)
Domestic crop production(tonnes) **(AGRO-PARKS)**	-0.681060	-3.070939**	
Total Export Volumes (tonnes) **(AGRO-PARKS)**	-1.984201	-7.111230***	I(0)
Industrial Electricity Sales (**ESEEP**)	-2.564528	-2.488522	I(1)
Electricity Production (**ESEEP**)	-8.767657***	-9.126822***	I(0)
Housing starts total (**AMANDA**)	-0.784072	-1.926917	I(1)

Note:
ADF- Augmented Dickey – Fuller (1979), PP – Phillips-Perron Test (1988)
[a]specifies that the tests included an intercept and a linear trend
[b]specifies that the tests included an intercept and no linear trend
*, **,*** denotes the 10%, 5% and 1% level of significance, respectively. t-statistics are reported in the table. Without asterisks suggest that we fail to reject and conclude that the variable has a unit root and is therefore non-stationary.
Logarithmic transformation was conducted on ESEEP, AGRO-PARKS, AMANDA and LAMP.

Table 7: BOJ's Derived Structural Reform Completion Index

Growth Enhancing Reforms	Completion Index
Business Process Outsourcing (BPO)	1.00
Application Management and Data Automation (AMANDA) System	1.00
Energy Sector Efficiency and Expansion Programme (ESEEP)	0.95
Agro Parks Implementation	0.89
Multi-Purpose Business Registration Form (MBRF)	0.73
Land Titling (LAMP)	0.42
Port Community System (PCS)	0.27
Aggregate Completion	**0.75**

Figure 2: Issued Land Titles and LAMP Targets



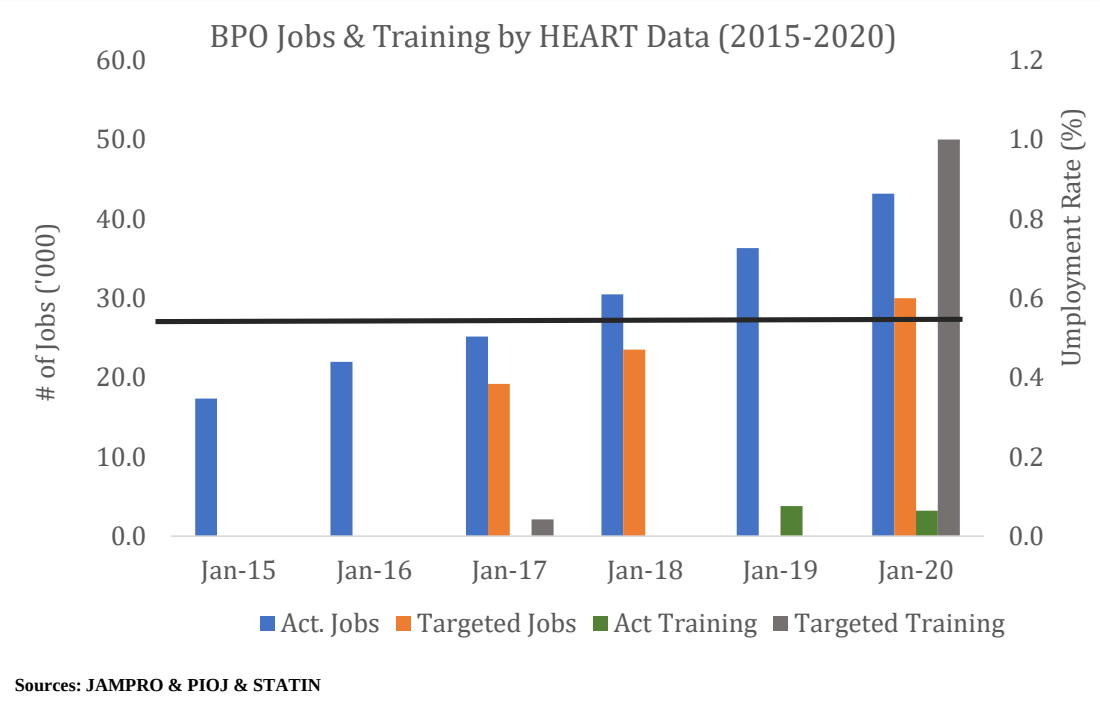
Source: National Land Agency

Figure 3: BPO Jobs and Training by HEART

Certification Training: Business Process Outsourcing

	Actual	FY 2018/19 Target	% Variance
Direct	3353	3847	(12.8)
Indirect	2436	3670	(33.6)
Total	5789	7517	(23.0)
		FY 2019/20	
Direct	3210	3547	(9.5)
Indirect	2414	4878	(50.5)
Total	**5624**	**8425**	(33.2)

Source: JAMPRO



Sources: JAMPRO & PIOJ & STATIN

Figure 4: Agro-Parks Production (000'kg) 2013-2019

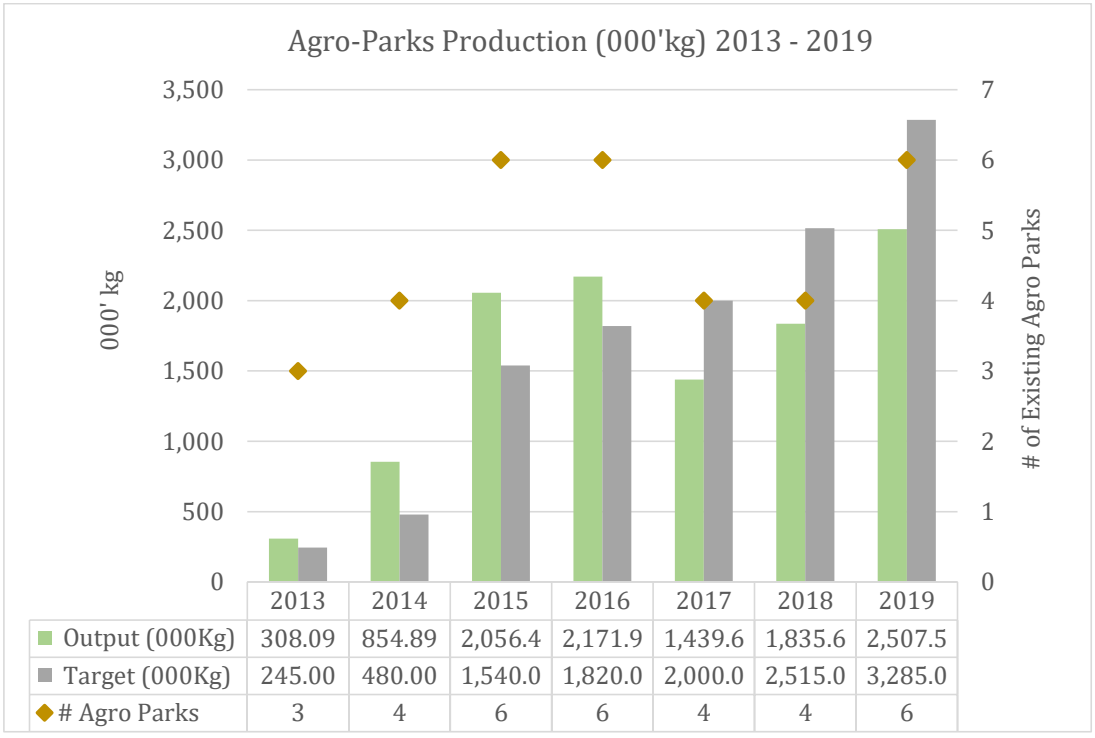


Table 8: Ease of Getting Electricity and Distribution Loss

Jamaica: Ease of Getting Electricity (Rank)		
Catergory	**2018**	**2013**
Getting Electricity (Rank)	115	132
Procedures (number)	7	6
Time (days)	95	96
Cost (% of income per capita)	204	541

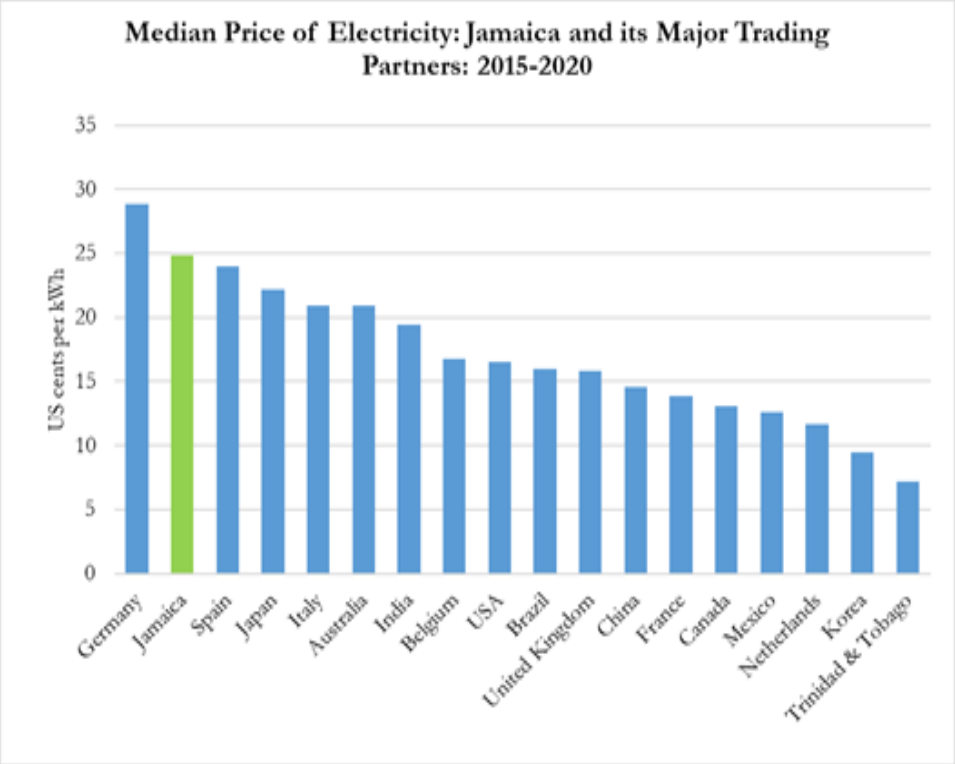
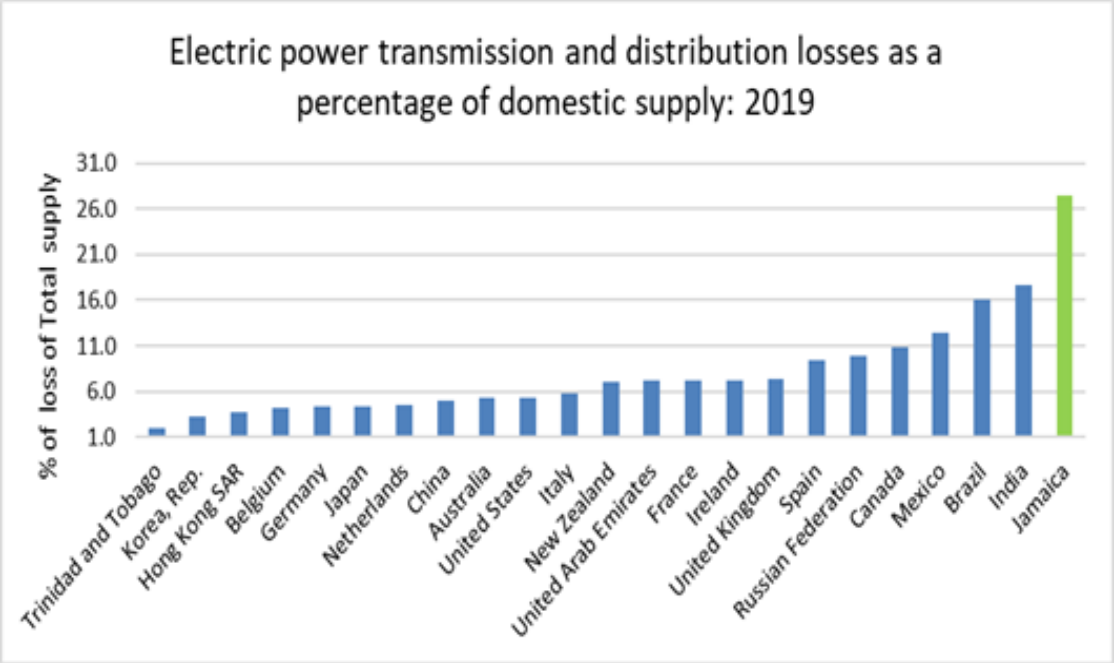


Table 9: World Bank Ease of Doing Business Reports (2014 & 2019)



Source: Global Competitiveness Report, WEF

Global Electricity Prices as at September 2019

Country	US$ per kwh (Business)
Barbados	0.284
Jamaica	0.235
Singapore	0.149
Mexico	0.147
Brazil	0.127
USA	0.114
China	0.094
Canada	0.089
Trinidad & Tobago	0.053

Source: Globalpetrolprices.com

Table 10: Ease of Doing and Starting Business and Ease of Construction Permits

Jamaica: Ease of Doing Business & Starting a Business

Category	2018	2013
Ease of Doing Business (Rank)	75	94
Starting a Business (Rank)	6	23
Procedure #	2	5
Time (days)	3	6
Cost % of Y	4.4	6.4

Source: World Bank Ease of Doing Business Reports

Jamaica: Ease of Construction Permit (Rank)

Category	2018	2013
Construction Permit (Rank)	76	52
Procedures (number)	19	8
Time (days)	141	135
Cost (% of income)	1.6	207.1

Source: World Bank Ease of Doing Business Reports

Figure 5: Number of Registered Collateral

Jamaica: Ease of Trading Across Border

Category	2018	2015	Chg
Trading Across Border (Rank)	134	146	(12)
Score: Trading Across Border (0 - 100)	62	51	11
Time to Export			
Document Compliance (hrs)	47	62	(15)
Border Compliance (hrs)	58	82	(24)
Cost to Export			
Document Compliance (US$)	90	314	(224)
Border Compliance (US$)	876	599	277
Time to Import			
Document Compliance (hrs)	56	87	(31)
Border Compliance (hrs)	80	106	(26)
Cost to Import			
Document Compliance (US$)	90	331	(241)
Border Compliance (US$)	906	606	300

Source: World Bank Ease of Doing Business Reports

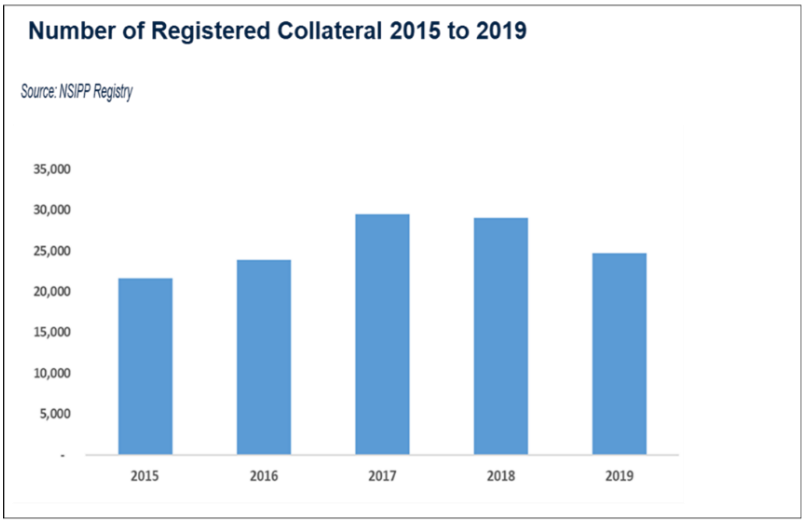


Table 11: Yearly Completion Index of Growth Enhancing Reforms

Year	Average Completion
2013	1.00
2014	0.98
2015	0.84
2016	0.84
2017	0.60
2018	0.51
2019	0.65

Figure 6: Agriculture Structural Reform Model Specification

Agro-Parks Reform

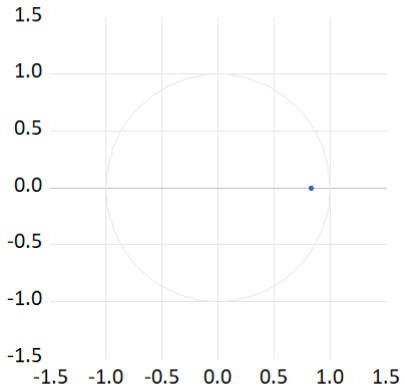
Agro-Park Full Model Specification tests

VAR Lag Order Selection Criteria
Endogenous variables: RGROWTH
Exogenous variables: C CONT_CADG(-2) DCONT_INVGDP_SA(-1) DLAGROP_DP_...
Date: 09/16/21 Time: 17:06
Sample: 12/01/1998 12/01/2019
Included observations: 80

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-152.1384	NA	3.292142	4.028459	4.296437	4.135899
1	-102.7846	86.36913*	0.983195*	2.819614*	3.117368*	2.938992*
2	-102.4451	0.585541	1.000004	2.836128	3.163657	2.967444
3	-101.3084	1.932462	0.997118	2.832710	3.190014	2.975963
4	-100.9448	0.608935	1.013745	2.848621	3.235700	3.003812

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Inverse Roots of AR Characteristic Polynomial



VAR Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: Residuals are multivariate normal
Date: 09/16/21 Time: 17:07
Sample: 12/01/1998 12/01/2019
Included observations: 83

Component	Skewness	Chi-sq	df	Prob.*
1	-0.057366	0.045523	1	0.8310
Joint		0.045523	1	0.8310

Component	Kurtosis	Chi-sq	df	Prob.
1	2.394509	1.267891	1	0.2602
Joint		1.267891	1	0.2602

Component	Jarque-Bera	df	Prob.
1	1.313414	2	0.5186
Joint	1.313414	2	0.5186

*Approximate p-values do not account for coefficient estimation

VAR Residual Serial Correlation LM Tests
Date: 09/16/21 Time: 17:08
Sample: 12/01/1998 12/01/2019
Included observations: 83

Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	0.000934	1	0.9756	0.000940	(1, 72.0)	0.9756
2	0.047947	1	0.8267	0.048299	(1, 72.0)	0.8267
3	1.484430	1	0.2231	1.510435	(1, 72.0)	0.2231
4	0.738942	1	0.3900	0.747967	(1, 72.0)	0.3900

Figure 7: Agriculture Structural Reform VAR Model

Agro-Park VAR specification Results

Vector Autoregression Estimates
Sample (adjusted): 6/01/1999 12/01/2019
Included observations: 83 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	RGROWTH
RGROWTH(-1)	0.828421
	(0.06483)
	[12.7790]
C	0.541170
	(0.25938)
	[2.08639]
CONT_CADG(-2)	0.042456
	(0.02251)
	[1.88626]
DCONT_INVGDP_SA(-1)	14.32135
	(4.73397)
	[3.02523]
DLAGROP_DP_SA	2.154721
	(0.90972)
	[2.36855]
DLAGROP_DP_SA(-1)	0.835875
	(0.86319)
	[0.96835]
AGROEVG(-1)	-0.003860
	(0.00159)
	[-2.42796]
AGROREFORM	-0.060167
	(0.25568)
	[-0.23532]
DUMSEPT07	-0.837695
	(0.97661)
	[-0.85775]
R-squared	0.724836
Adj. R-squared	0.695089
Sum sq. resids	66.42412
S.E. equation	0.947430
F-statistic	24.36633
Log likelihood	-108.5265
Akaike AIC	2.831964
Schwarz SC	3.094248
Mean dependent	0.759479
S.D. dependent	1.715775

Figure 8: Agriculture Structural Reform Johansen Cointegration Test

Agro-Park Reform Test of a Cointegrating Relationship

Date: 09/16/21 Time: 17:28
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Trend assumption: Linear deterministic trend
Series: RGROWTH CONT_CADG CONT_INVGDP_SA LAGROP_DP_SA AGROEVG
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.470153	109.2881	69.81889	0.0000
At most 1 *	0.300386	57.20450	47.85613	0.0052
At most 2	0.200198	27.91192	29.79707	0.0812
At most 3	0.066580	9.593802	15.49471	0.3133
At most 4 *	0.046959	3.943992	3.841465	0.0470

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.470153	52.08364	33.87687	0.0001
At most 1 *	0.300386	29.29259	27.58434	0.0299
At most 2	0.200198	18.31811	21.13162	0.1184
At most 3	0.066580	5.649810	14.26460	0.6585
At most 4 *	0.046959	3.943992	3.841465	0.0470

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

RGROWTH	CONT_CADG	CONT_INVGDP_SA	LAGROP_DP_SA	AGROEVG
0.277356	0.018520	-24.39199	-4.634206	0.020182
0.838691	-0.035099	-52.48538	-5.557502	-0.011774
0.351373	-0.176417	3.251478	4.330958	0.001486
0.201727	0.146334	20.20783	0.024108	-0.000898
-0.022151	0.061298	-12.15612	2.795284	0.000429

Unrestricted Adjustment Coefficients (alpha):

Figure 9: Agriculture Structural Reform Johansen Cointegration Test

D(RGROWTH)	-0.331394	-0.167763	-0.366125	-0.057433	0.040944
D(CONT_CADG)	-0.533374	-0.212222	0.697735	-0.740095	-0.222932
D(CONT_INVGDP_SA)	0.006723	0.004344	-0.002256	-0.000300	0.002922
D(LAGROP_DP_SA)	0.006297	0.022738	-0.033823	-0.009149	-0.014494
D(AGROEVG)	-44.77232	26.78908	0.777068	3.571751	2.790733

1 Cointegrating Equation(s): Log likelihood -507.9967

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	LAGROP_DP_SA	AGROEVG
1.000000	0.066773	-87.94462	-16.70849	0.072767
	(0.10298)	(18.4632)	(3.35656)	(0.01020)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.091914
	(0.03158)
D(CONT_CADG)	-0.147935
	(0.11181)
D(CONT_INVGDP_SA)	0.001865
	(0.00057)
D(LAGROP_DP_SA)	0.001747
	(0.00368)
D(AGROEVG)	-12.41788
	(2.26657)

2 Cointegrating Equation(s): Log likelihood -493.3504

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	LAGROP_DP_SA	AGROEVG
1.000000	0.000000	-72.35239	-10.51076	0.019405
		(8.92558)	(1.46774)	(0.00493)
0.000000	1.000000	-233.5102	-92.81759	0.799154
		(188.149)	(30.9395)	(0.10392)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.232616	-0.000249
	(0.09911)	(0.00445)
D(CONT_CADG)	-0.325924	-0.002429
	(0.35544)	(0.01597)
D(CONT_INVGDP_SA)	0.005508	-2.80E-05
	(0.00178)	(8.0E-05)
D(LAGROP_DP_SA)	0.020817	-0.000681
	(0.01149)	(0.00052)
D(AGROEVG)	10.04987	-1.769444
	(6.68171)	(0.30018)

3 Cointegrating Equation(s): Log likelihood -484.1913

Figure 10: Agriculture Structural Reform Johansen Cointegration Test

Agro-Park Reform Test of a Cointegrating Relationship

Date: 09/16/21 Time: 17:28
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Trend assumption: Linear deterministic trend
Series: RGROWTH CONT_CADG CONT_INVGDP_SA LAGROP_DP_SA AGROEVG
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.470153	109.2881	69.81889	0.0000
At most 1 *	0.300386	57.20450	47.85613	0.0052
At most 2	0.200198	27.91192	29.79707	0.0812
At most 3	0.066580	9.593802	15.49471	0.3133
At most 4 *	0.046959	3.943992	3.841465	0.0470

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.470153	52.08364	33.87687	0.0001
At most 1 *	0.300386	29.29259	27.58434	0.0299
At most 2	0.200198	18.31811	21.13162	0.1184
At most 3	0.066580	5.649810	14.26460	0.6585
At most 4 *	0.046959	3.943992	3.841465	0.0470

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

RGROWTH	CONT_CADG	CONT_INVGDP_SA	LAGROP_DP_SA	AGROEVG
0.277356	0.018520	-24.39199	-4.634206	0.020182
0.838691	-0.035099	-52.48538	-5.557502	-0.011774
0.351373	-0.176417	3.251478	4.330958	0.001486
0.201727	0.146334	20.20783	0.024108	-0.000898
-0.022151	0.061298	-12.15612	2.795284	0.000429

Unrestricted Adjustment Coefficients (alpha):

Figure 11: Agriculture Structural Reform Johansen Cointegration Test

D(RGROWTH)	-0.331394	-0.167763	-0.366125	-0.057433	0.040944
D(CONT_CADG)	-0.533374	-0.212222	0.697735	-0.740095	-0.222932
D(CONT_INVGDP_SA)	0.006723	0.004344	-0.002256	-0.000300	0.002922
D(LAGROP_DP_SA)	0.006297	0.022738	-0.033823	-0.009149	-0.014494
D(AGROEVG)	-44.77232	26.78908	0.777068	3.571751	2.790733

1 Cointegrating Equation(s): Log likelihood -507.9967

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	LAGROP_DP_SA	AGROEVG
1.000000	0.066773	-87.94462	-16.70849	0.072767
	(0.10298)	(18.4632)	(3.35656)	(0.01020)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.091914
	(0.03158)
D(CONT_CADG)	-0.147935
	(0.11181)
D(CONT_INVGDP_SA)	0.001865
	(0.00057)
D(LAGROP_DP_SA)	0.001747
	(0.00368)
D(AGROEVG)	-12.41788
	(2.26657)

2 Cointegrating Equation(s): Log likelihood -493.3504

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	LAGROP_DP_SA	AGROEVG
1.000000	0.000000	-72.35239	-10.51076	0.019405
		(8.92558)	(1.46774)	(0.00493)
0.000000	1.000000	-233.5102	-92.81759	0.799154
		(188.149)	(30.9395)	(0.10392)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.232616	-0.000249
	(0.09911)	(0.00445)
D(CONT_CADG)	-0.325924	-0.002429
	(0.35544)	(0.01597)
D(CONT_INVGDP_SA)	0.005508	-2.80E-05
	(0.00178)	(8.0E-05)
D(LAGROP_DP_SA)	0.020817	-0.000681
	(0.01149)	(0.00052)
D(AGROEVG)	10.04987	-1.769444
	(6.68171)	(0.30018)

3 Cointegrating Equation(s): Log likelihood -484.1913

Figure 12: Agriculture Structural Reform Johansen Cointegration Test

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	LAGROP_DP_SA	AGROEVG
1.000000	0.000000	0.000000	37.74220	-0.764462
			(24.7613)	(0.10419)
0.000000	1.000000	0.000000	62.91412	-1.730700
			(58.2223)	(0.24500)
0.000000	0.000000	1.000000	0.666916	-0.010834
			(0.34778)	(0.00146)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.361263	0.064341	15.69805	
	(0.09880)	(0.01879)	(6.02450)	
D(CONT_CADG)	-0.080758	-0.125521	26.41730	
	(0.37477)	(0.07128)	(22.8519)	
D(CONT_INVGDP_SA)	0.004715	0.000370	-0.399337	
	(0.00190)	(0.00036)	(0.11562)	
D(LAGROP_DP_SA)	0.008932	0.005285	-1.456994	
	(0.01180)	(0.00224)	(0.71935)	
D(AGROEVG)	10.32291	-1.906532	-311.4220	
	(7.19039)	(1.36766)	(438.434)	

4 Cointegrating Equation(s): Log likelihood -481.3664

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	LAGROP_DP_SA	AGROEVG
1.000000	0.000000	0.000000	0.000000	0.015377
				(0.01352)
0.000000	1.000000	0.000000	0.000000	-0.430752
				(0.06862)
0.000000	0.000000	1.000000	0.000000	0.002946
				(0.00049)
0.000000	0.000000	0.000000	1.000000	-0.020662
				(0.00279)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.372848	0.055937	14.53744	0.881037
	(0.10080)	(0.02413)	(6.36707)	(0.87467)
D(CONT_CADG)	-0.230056	-0.233822	11.46158	6.655209
	(0.37401)	(0.08952)	(23.6252)	(3.24547)
D(CONT_INVGDP_SA)	0.004655	0.000326	-0.405402	-0.065078
	(0.00194)	(0.00046)	(0.12243)	(0.01682)
D(LAGROP_DP_SA)	0.007087	0.003947	-1.641879	-0.302255
	(0.01202)	(0.00288)	(0.75904)	(0.10427)
D(AGROEVG)	11.04343	-1.383864	-239.2446	62.05534
	(7.33955)	(1.75677)	(463.620)	(63.6892)

Figure 13: Agriculture Reform Test of Weak Exogeneity and Granger Causality

Agro-Park Reform: Test of Weak Exogeneity in Transmission Variables

Vector Error Correction Estimates
Date: 09/16/21 Time: 18:15
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegration Restrictions:
A(2,1)=0
Convergence achieved after 6 iterations.
Not all cointegrating vectors are identified
LR test for binding restrictions (rank = 1):
Chi-square(1) 0.869213
Probability 0.351173

Cointegrating Eq:	CointEq1
RGROWTH(-1)	-0.939770
LAGROP_DP_SA(-1)	4.504858
C	-52.30194

Vector Error Correction Estimates
Date: 09/16/21 Time: 18:18
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegration Restrictions:
A(2,1)=0
Convergence achieved after 8 iterations.
Not all cointegrating vectors are identified
LR test for binding restrictions (rank = 1):
Chi-square(1) 23.39958
Probability 0.000001

Cointegrating Eq:	CointEq1
RGROWTH(-1)	1.272635
AGROEVG(-1)	0.019607
C	-1.136919

Agro-Park Reform: Granger Causality Test (Z and Y causal relationship)

Pairwise Granger Causality Tests
Date: 09/16/21 Time: 17:36
Sample: 12/01/1998 12/01/2019
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DLAGROP_DP_SA does not Granger Cause RGROWTH	82	0.59618	0.5534
RGROWTH does not Granger Cause DLAGROP_DP_SA		1.44758	0.2415

Pairwise Granger Causality Tests
Date: 09/16/21 Time: 17:38
Sample: 12/01/1998 12/01/2019
Lags: 2

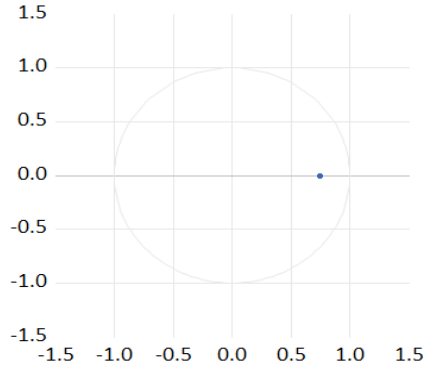
Null Hypothesis:	Obs	F-Statistic	Prob.
AGROEVG does not Granger Cause RGROWTH	82	3.41490	0.0379
RGROWTH does not Granger Cause AGROEVG		2.01530	0.1403

Figure 14: Business Processing Outsourcing (BPO) Reform Model Specification

Business Processing Outsourcing Reform

BPO *Full Model Specification tests*

Inverse Roots of AR Characteristic Polynomial



VAR Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: Residuals are multivariate normal
Date: 09/16/21 Time: 17:50
Sample: 12/01/1998 12/01/2019
Included observations: 83

Component	Skewness	Chi-sq	df	Prob.*
1	-0.044926	0.027920	1	0.8673
Joint		0.027920	1	0.8673

Component	Kurtosis	Chi-sq	df	Prob.
1	3.029302	0.002969	1	0.9565
Joint		0.002969	1	0.9565

Component	Jarque-Bera	df	Prob.
1	0.030889	2	0.9847
Joint	0.030889	2	0.9847

*Approximate p-values do not account for coefficient estimation

VAR Residual Serial Correlation LM Tests
Date: 09/16/21 Time: 17:45
Sample: 12/01/1998 12/01/2019
Included observations: 83

Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	0.847535	1	0.3573	0.858388	(1, 73.0)	0.3572
2	0.204457	1	0.6511	0.206158	(1, 73.0)	0.6511
3	2.516044	1	0.1127	2.577869	(1, 73.0)	0.1127
4	2.807628	1	0.0938	2.882444	(1, 73.0)	0.0938

Null hypothesis: No serial correlation at lags 1 to h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	0.847535	1	0.3573	0.858388	(1, 73.0)	0.3572
2	1.290632	2	0.5245	NA	(2, NA)	NA
3	2.916648	3	0.4047	0.985379	(3, 71.0)	0.4047
4	5.190484	4	0.2683	1.327269	(4, 70.0)	0.2684

*Edgeworth expansion corrected likelihood ratio statistic.

VAR Lag Order Selection Criteria
Endogenous variables: RGROWTH
Exogenous variables: C CONT_CADG(-2) DCONT_INVGDP_SA(-1) DEMPR(0 TO -1)...
Date: 09/16/21 Time: 17:51
Sample: 12/01/1998 12/01/2019
Included observations: 80

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-146.7348	NA	2.804329	3.868371	4.106573	3.963873
1	-106.9137	70.68254*	1.062815*	2.897842*	3.165820*	3.005282*
2	-106.2414	1.176398	1.071944	2.906036	3.203789	3.025414
3	-105.3122	1.602924	1.074313	2.907805	3.235334	3.039121
4	-105.0065	0.519702	1.093700	2.925163	3.282467	3.068416

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Figure 15: Business Processing Outsourcing (BPO) Reform VAR Model

BPO VAR Specification Results

Vector Autoregression Estimates
Date: 09/16/21 Time: 17:43
Sample (adjusted): 6/01/1999 12/01/2019
Included observations: 83 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	RGROWTH
RGROWTH(-1)	0.772270
	(0.06974)
	[11.0742]
C	0.620894
	(0.27708)
	[2.24086]
CONT_CADG(-2)	0.042169
	(0.02438)
	[1.72940]
DCONT_INVGDP_SA(-1)	13.07770
	(5.02751)
	[2.60123]
DEMPR	0.063968
	(0.15232)
	[0.41997]
DEMPR(-1)	0.138609
	(0.14830)
	[0.93464]
DUMDEC07	-1.252204
	(1.01176)
	[-1.23765]
BPOREFORM	-3.222152
	(0.99742)
	[-3.23050]
BPOREFORM(-1)	2.979065
	(1.02383)
	[2.90973]
R-squared	0.710903
Adj. R-squared	0.679649
Sum sq. resids	69.78766
S.E. equation	0.971121
F-statistic	22.74614
Log likelihood	-110.5765
Akaike AIC	2.881361
Schwarz SC	3.143645
Mean dependent	0.759479
S.D. dependent	1.715775

Figure 16: Business Processing Outsourcing (BPO) Reform Johansen Cointegration Test

Business Processing Outsourcing Test of Cointegrating Relationship

Date: 09/16/21 Time: 17:53
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Trend assumption: Linear deterministic trend
Series: RGROWTH CONT_CADG CONT_INVGDP_SA EMPR
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.257662	47.91492	47.85613	0.0494
At most 1	0.155702	23.48301	29.79707	0.2232
At most 2	0.104544	9.604574	15.49471	0.3124
At most 3	0.006684	0.549947	3.841465	0.4583

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.257662	24.43191	27.58434	0.1204
At most 1	0.155702	13.87844	21.13162	0.3751
At most 2	0.104544	9.054627	14.26460	0.2816
At most 3	0.006684	0.549947	3.841465	0.4583

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

RGROWTH	CONT_CADG	CONT_INVGDP_SA	EMPR
-0.792901	0.108378	24.40852	0.006685
0.003048	-0.180104	-28.60301	-0.087861
0.116131	0.084020	-17.74824	-0.315309
0.060619	-0.066836	14.71355	-0.409792

Unrestricted Adjustment Coefficients (alpha):

D(RGROWTH)	0.511457	-0.032136	0.102452	0.017262
D(CONT_CADG)	-0.131061	0.941040	-0.484733	0.171383
D(CONT_INVGDP_SA)	-0.002427	0.001137	0.005732	-0.000375
D(EMPR)	-0.102003	-0.179826	0.059035	0.042671

Figure 17: Business Processing Outsourcing (BPO) Reform Johansen Cointegration Test

1 Cointegrating Equation(s): Log likelihood -205.0894

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	EMPR
1.000000	-0.136685	-30.78381	-0.008430
	(0.05244)	(8.81173)	(0.12716)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.405535
	(0.08654)
D(CONT_CADG)	0.103918
	(0.32000)
D(CONT_INVGDP_SA)	0.001924
	(0.00173)
D(EMPR)	0.080879
	(0.06705)

2 Cointegrating Equation(s): Log likelihood -198.1501

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	EMPR
1.000000	0.000000	-9.097361	0.058384
		(10.6933)	(0.16472)
0.000000	1.000000	158.6597	0.488820
		(49.8059)	(0.76720)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.405633	0.061219
	(0.08649)	(0.02293)
D(CONT_CADG)	0.106786	-0.183689
	(0.30834)	(0.08174)
D(CONT_INVGDP_SA)	0.001928	-0.000468
	(0.00172)	(0.00046)
D(EMPR)	0.080331	0.021333
	(0.06502)	(0.01724)

3 Cointegrating Equation(s): Log likelihood -193.6228

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	EMPR
1.000000	0.000000	0.000000	0.168429
			(0.19090)
0.000000	1.000000	0.000000	-1.430382
			(0.98733)
0.000000	0.000000	1.000000	0.012096
			(0.00633)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.393735	0.069827	11.58477

Figure 18: Business Processing Outsourcing (BPO) Reform Johansen Cointegration Test

	(0.08690)	(0.02455)	(4.50904)
D(CONT_CADG)	0.050494	-0.224417	-21.51243
	(0.30843)	(0.08713)	(16.0035)
D(CONT_INVGDP_SA)	0.002593	1.37E-05	-0.193501
	(0.00166)	(0.00047)	(0.08618)
D(EMPR)	0.087186	0.026293	1.606043
	(0.06549)	(0.01850)	(3.39807)

Figure 19: Business Processing Outsourcing (BPO) Test of Weak Exogeneity and Granger Causality

BPO Reform: Test of Weak Exogeneity in Transmission Variables

Vector Error Correction Estimates
Date: 09/16/21 Time: 18:23
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegration Restrictions:
A(2,1)=0
Convergence achieved after 2 iterations.
Not all cointegrating vectors are identified
LR test for binding restrictions (rank = 1):

Chi-square(1)	0.246533
Probability	0.619527

Cointegrating Eq:	CointEq1
RGROWTH(-1)	-0.602059
EMPR(-1)	-0.169575
C	15.23933

BPO Reform: Granger Causality Test (Z and Y causal relationship)

Pairwise Granger Causality Tests
Date: 09/16/21 Time: 17:59
Sample: 12/01/1998 12/01/2019
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DEMPR does not Granger Cause RGROWTH	82	0.21813	0.8045
RGROWTH does not Granger Cause DEMPR		3.22995	0.0450

Figure 20: Energy Security and Efficiency Enhancement (ESEEP) Reform Model Specification

Energy Security and Efficiency Enhancement Reform

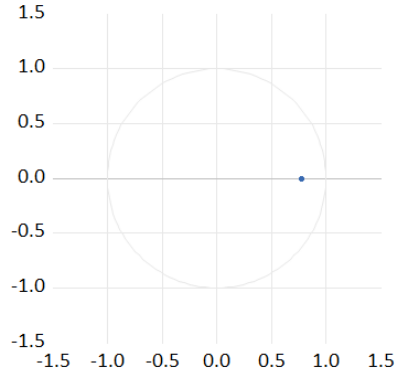
ESSEP *Full Model Specification tests*

VAR Lag Order Selection Criteria
Endogenous variables: RGROWTH
Exogenous variables: C CONT_CADG(-1) DCONT_INVGDP_SA(-1) ESEEP_EP_SA(-...
Date: 09/16/21 Time: 18:45
Sample: 12/01/1998 12/01/2019
Included observations: 80

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-151.7768	NA	3.346310	4.044421	4.342174	4.163799
1	-109.6858	72.60702*	1.198441	3.017145	3.344674*	3.148461*
2	-109.2208	0.790441	1.215220	3.030521	3.387825	3.173774
3	-107.7016	2.544796	1.200297	3.017539	3.404618	3.172730
4	-106.2275	2.432139	1.187027*	3.005688*	3.422543	3.172817

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Inverse Roots of AR Characteristic Polynomial



VAR Residual Serial Correlation LM Tests
Date: 09/16/21 Time: 18:46
Sample: 12/01/1998 12/01/2019
Included observations: 83

Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	0.000419	1	0.9837	0.000422	(1, 71.0)	0.9837
2	0.290999	1	0.5896	0.293668	(1, 71.0)	0.5896
3	5.959830	1	0.0146	6.263099	(1, 71.0)	0.0146
4	1.220355	1	0.2693	1.239709	(1, 71.0)	0.2693

Null hypothesis: No serial correlation at lags 1 to h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	0.000419	1	0.9837	0.000422	(1, 71.0)	0.9837
2	0.318520	2	0.8528	NA	(2, NA)	NA
3	6.464256	3	0.0911	2.241894	(3, 69.0)	0.0911
4	11.01721	4	0.0264	2.943095	(4, 68.0)	0.0264

*Edgeworth expansion corrected likelihood ratio statistic.

VAR Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: Residuals are multivariate normal
Date: 09/16/21 Time: 18:47
Sample: 12/01/1998 12/01/2019
Included observations: 83

Component	Skewness	Chi-sq	df	Prob.*
1	-0.277923	1.068506	1	0.3013
Joint		1.068506	1	0.3013

Component	Kurtosis	Chi-sq	df	Prob.
1	3.272561	0.256917	1	0.6122
Joint		0.256917	1	0.6122

Component	Jarque-Bera	df	Prob.
1	1.325423	2	0.5155
Joint	1.325423	2	0.5155

*Approximate p-values do not account for coefficient estimation

Figure 21: Energy Security and Efficiency Enhancement (ESEEP) Reform VAR Model

ESEEP VAR Specification Results

Vector Autoregression Estimates
Date: 09/16/21 Time: 18:48
Sample (adjusted): 6/01/1999 12/01/2019
Included observations: 83 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	RGROWTH
RGROWTH(-1)	0.773294 (0.06773) [11.4181]
C	0.775365 (2.11685) [0.36628]
CONT_CADG(-1)	0.022535 (0.02385) [0.94485]
DCONT_INVGDP_SA(-1)	15.52923 (5.30078) [2.92961]
ESEEP_EP_SA(-1)	-6.19E-07 (2.7E-06) [-0.22627]
DLESEEP_IES_SA	8.413186 (4.29058) [1.96085]
DLESEEP_IES_SA(-1)	8.846432 (4.21902) [2.09680]
DUMDEC07	-1.211669 (1.12313) [-1.07883]
DUMDEC10	0.398797 (1.05919) [0.37651]
ESSEPREFORM	0.128726 (0.74131) [0.17365]
ESSEPREFORM(-1)	-0.093605 (0.74750) [-0.12522]
R-squared	0.690655
Adj. R-squared	0.647691

Figure 22: Energy Security and Efficiency Enhancement (ESEEP) Reform VAR Model

Sum sq. resids	74.67535
S.E. equation	1.018409
F-statistic	16.07500
Log likelihood	-113.3857
Akaike AIC	2.997247
Schwarz SC	3.317816
Mean dependent	0.759479
S.D. dependent	1.715775

Figure 23: Energy Security and Efficiency Enhancement (ESEEP) Reform VAR Model

ESEEP Test of Cointegrating Relationship

Date: 09/16/21 Time: 18:50
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Trend assumption: Linear deterministic trend
Series: RGROWTH CONT_CADG CONT_INVGDP_SA ESEEP_EP_SA LESEEP_IES_SA
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.381297	76.81382	69.81889	0.0124
At most 1	0.165436	37.44319	47.85613	0.3269
At most 2	0.122662	22.61379	29.79707	0.2656
At most 3	0.104021	11.88301	15.49471	0.1626
At most 4	0.034469	2.876296	3.841465	0.0899

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.381297	39.37063	33.87687	0.0100
At most 1	0.165436	14.82940	27.58434	0.7616
At most 2	0.122662	10.73078	21.13162	0.6741
At most 3	0.104021	9.006716	14.26460	0.2856
At most 4	0.034469	2.876296	3.841465	0.0899

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

RGROWTH	CONT_CADG	CONT_INVGDP_SA	ESEEP_EP_SA	LESEEP_IES_SA
-0.809381	0.179897	72.68328	-3.96E-05	30.38297
-0.224986	0.101337	-17.96162	1.76E-05	-18.66366
0.292950	0.076488	21.36938	-5.25E-06	1.562867
-0.154812	0.066164	6.965723	4.83E-05	-17.35301
0.084820	0.155126	3.934293	-5.88E-06	11.39006

Unrestricted Adjustment Coefficients (alpha):

D(RGROWTH)	0.368939	0.261216	-0.187711	0.060200	-0.019377
D(CONT_CADG)	-0.039620	-0.752873	-0.429726	-0.320422	-0.485205

Figure 24: Energy Security and Efficiency Enhancement (ESEEP) Reform Johansen Cointegration Test

ESEEP Test of Cointegrating Relationship

Date: 09/16/21 Time: 18:50
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Trend assumption: Linear deterministic trend
Series: RGROWTH CONT_CADG CONT_INVGDP_SA ESEEP_EP_SA LESEEP_IES_SA
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.381297	76.81382	69.81889	0.0124
At most 1	0.165436	37.44319	47.85613	0.3269
At most 2	0.122662	22.61379	29.79707	0.2656
At most 3	0.104021	11.88301	15.49471	0.1626
At most 4	0.034469	2.876296	3.841465	0.0899

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.381297	39.37063	33.87687	0.0100
At most 1	0.165436	14.82940	27.58434	0.7616
At most 2	0.122662	10.73078	21.13162	0.6741
At most 3	0.104021	9.006716	14.26460	0.2856
At most 4	0.034469	2.876296	3.841465	0.0899

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

RGROWTH	CONT_CADG	CONT_INVGDP_SA	ESEEP_EP_SA	LESEEP_IES_SA
-0.809381	0.179897	72.68328	-3.96E-05	30.38297
-0.224986	0.101337	-17.96162	1.76E-05	-18.66366
0.292950	0.076488	21.36938	-5.25E-06	1.562867
-0.154812	0.066164	6.965723	4.83E-05	-17.35301
0.084820	0.155126	3.934293	-5.88E-06	11.39006

Unrestricted Adjustment Coefficients (alpha):

D(RGROWTH)	0.368939	0.261216	-0.187711	0.060200	-0.019377
D(CONT_CADG)	-0.039620	-0.752873	-0.429726	-0.320422	-0.485205

Figure 25: Energy Security and Efficiency Enhancement (ESEEP) Reform Johansen Cointegration Test

D(CONT_INVGDP_SA)	-0.007550	0.004881	-0.000866	-0.001628	0.001130
D(ESEEP_EP_SA)	4964.582	4117.858	3602.107	-3933.134	-606.7216
D(LESEEP_IES_SA)	0.001945	0.006587	0.005435	-0.000832	-0.002674

1 Cointegrating Equation(s): Log likelihood -817.2723

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	ESEEP_EP_SA	LESEEP_IES_SA
1.000000	-0.222265	-89.80109	4.89E-05	-37.53853
	(0.04146)	(10.2403)	(1.1E-05)	(6.75714)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.298612
	(0.09187)
D(CONT_CADG)	0.032068
	(0.33373)
D(CONT_INVGDP_SA)	0.006111
	(0.00163)
D(ESEEP_EP_SA)	-4018.238
	(1887.01)
D(LESEEP_IES_SA)	-0.001574
	(0.00251)

2 Cointegrating Equation(s): Log likelihood -809.8576

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	ESEEP_EP_SA	LESEEP_IES_SA
1.000000	0.000000	-255.0609	0.000173	-154.9238
		(60.3045)	(7.3E-05)	(43.1614)
0.000000	1.000000	-743.5265	0.000556	-528.1322
		(261.641)	(0.00032)	(187.263)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.357382	0.092842
	(0.09193)	(0.02259)
D(CONT_CADG)	0.201454	-0.083421
	(0.33860)	(0.08322)
D(CONT_INVGDP_SA)	0.005013	-0.000864
	(0.00163)	(0.00040)
D(ESEEP_EP_SA)	-4944.699	1310.405
	(1917.39)	(471.264)
D(LESEEP_IES_SA)	-0.003056	0.001017
	(0.00253)	(0.00062)

3 Cointegrating Equation(s): Log likelihood -804.4922

Figure 26: Energy Security and Efficiency Enhancement (ESEEP) Reform Johansen Cointegration Test

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	ESEEP_EP_SA	LESEEP_IES_SA
1.000000	0.000000	0.000000	8.55E-06	-9.278638
			(2.6E-05)	(13.1066)
0.000000	1.000000	0.000000	7.83E-05	-103.5630
			(0.00011)	(54.2019)
0.000000	0.000000	1.000000	-6.43E-07	0.571021
			(2.6E-07)	(0.12976)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.412372	0.078484	18.11253	
	(0.09543)	(0.02362)	(8.35113)	
D(CONT_CADG)	0.075566	-0.116290	1.460112	
	(0.35587)	(0.08807)	(31.1437)	
D(CONT_INVGDP_SA)	0.004759	-0.000930	-0.654977	
	(0.00172)	(0.00043)	(0.15060)	
D(ESEEP_EP_SA)	-3889.463	1585.923	363853.5	
	(1996.63)	(494.145)	(174733.)	
D(LESEEP_IES_SA)	-0.001464	0.001433	0.139170	
	(0.00262)	(0.00065)	(0.22928)	

4 Cointegrating Equation(s): Log likelihood -799.9888

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	ESEEP_EP_SA	LESEEP_IES_SA
1.000000	0.000000	0.000000	0.000000	-6.499110
				(6.44254)
0.000000	1.000000	0.000000	0.000000	-78.10350
				(28.6775)
0.000000	0.000000	1.000000	0.000000	0.361846
				(0.09061)
0.000000	0.000000	0.000000	1.000000	-325236.4
				(86725.1)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.421691	0.082467	18.53187	-6.12E-06
	(0.09666)	(0.02461)	(8.36686)	(7.0E-06)
D(CONT_CADG)	0.125171	-0.137491	-0.771858	-2.49E-05
	(0.35967)	(0.09157)	(31.1340)	(2.6E-05)
D(CONT_INVGDP_SA)	0.005011	-0.001038	-0.666315	3.10E-07
	(0.00174)	(0.00044)	(0.15048)	(1.3E-07)
D(ESEEP_EP_SA)	-3280.568	1325.689	336456.4	-0.333114
	(1984.70)	(505.297)	(171801.)	(0.14305)
D(LESEEP_IES_SA)	-0.001335	0.001378	0.133371	-3.00E-08
	(0.00266)	(0.00068)	(0.23007)	(1.9E-07)

Figure 27: Energy Security and Efficiency Enhancement (ESEEP) Test of Weak Exogeneity and Granger Causality

ESEEP Reform: Test of Weak Exogeneity in Transmission Variables

Vector Error Correction Estimates
Date: 09/16/21 Time: 18:55
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegration Restrictions:
A(2,1)=0
Convergence achieved after 2 iterations.
Not all cointegrating vectors are identified
LR test for binding restrictions (rank = 1):
Chi-square(1) 0.010146
Probability 0.919766

Cointegrating Eq:	CointEq1
RGROWTH(-1)	-0.825569
LESEEP_IES_SA(-1)	3.102828
C	-39.92195

Vector Error Correction Estimates
Date: 09/16/21 Time: 19:03
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegration Restrictions:
A(2,1)=0
Convergence achieved after 4 iterations.
Not all cointegrating vectors are identified
LR test for binding restrictions (rank = 1):
Chi-square(1) 1.394046
Probability 0.237723

Cointegrating Eq:	CointEq1
RGROWTH(-1)	-0.804988
ESEEP_EP_SA(-1)	7.48E-08
C	0.560479

ESEEP Reform: Granger Causality Test (Z and Y causal relationship)

Pairwise Granger Causality Tests
Date: 09/07/21 Time: 21:29
Sample: 12/01/1998 12/01/2019
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DLESEEP_IES_SA does not Granger Cause RGROWTH	82	2.81433	0.0661
RGROWTH does not Granger Cause DLESEEP_IES_SA		0.12794	0.8801

Pairwise Granger Causality Tests
Date: 09/07/21 Time: 21:30
Sample: 12/01/1998 12/01/2019
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
ESEEP_EP_SA does not Granger Cause RGROWTH	82	3.65989	0.0303
RGROWTH does not Granger Cause ESEEP_EP_SA		1.25961	0.2895

Figure 28: LAMP Reform Model Specification

Land Titling Reform

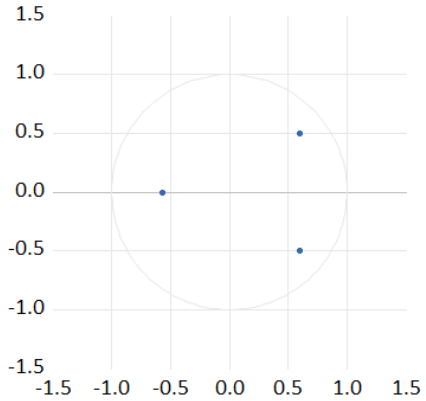
Land Titling Full Model Specification Tests

VAR Lag Order Selection Criteria
Endogenous variables: RGROWTH
Exogenous variables: C CONT_CADG(-1) LLANDT_INVEST_SA(0 TO -1) DUMDEC0...
Date: 09/16/21 Time: 19:10
Sample: 12/01/1998 12/01/2019
Included observations: 80

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-132.4930	NA	2.014569	3.537326	3.805304	3.644766
1	-113.6724	32.93605	1.290782	3.091811	3.389564	3.211189
2	-112.5479	1.939753	1.287335	3.088699	3.416227	3.220014
3	-106.4366	10.38936*	1.133508*	2.960914*	3.318218*	3.104167*
4	-106.4352	0.002302	1.162891	2.985880	3.372959	3.141071

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Inverse Roots of AR Characteristic Polynomial



VAR Residual Serial Correlation LM Tests
Date: 09/16/21 Time: 19:11
Sample: 12/01/1998 12/01/2019
Included observations: 81

Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	0.750659	1	0.3863	0.760440	(1, 68.0)	0.3863
2	1.528913	1	0.2163	1.557815	(1, 68.0)	0.2163
3	0.157198	1	0.6917	0.158547	(1, 68.0)	0.6917
4	0.537942	1	0.4633	0.544092	(1, 68.0)	0.4633

Null hypothesis: No serial correlation at lags 1 to h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	0.750659	1	0.3863	0.760440	(1, 68.0)	0.3863
2	1.633453	2	0.4419	NA	(2, NA)	NA
3	1.688542	3	0.6395	0.565768	(3, 66.0)	0.6395
4	2.396362	4	0.6633	0.600855	(4, 65.0)	0.6634

*Edgeworth expansion corrected likelihood ratio statistic.

VAR Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: Residuals are multivariate normal
Date: 09/16/21 Time: 19:12
Sample: 12/01/1998 12/01/2019
Included observations: 81

Component	Skewness	Chi-sq	df	Prob.*
1	-0.323390	1.411846	1	0.2348
Joint		1.411846	1	0.2348

Component	Kurtosis	Chi-sq	df	Prob.
1	4.036338	3.624741	1	0.0569
Joint		3.624741	1	0.0569

Component	Jarque-Bera	df	Prob.
1	5.036587	2	0.0806
Joint	5.036587	2	0.0806

*Approximate p-values do not account for coefficient estimation

Figure 29: LAMP Reform VAR Model

Land Titling VAR Specification Results

Vector Autoregression Estimates
Date: 09/08/21 Time: 07:13
Sample (adjusted): 12/01/1999 12/01/2019
Included observations: 81 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	RGROWTH
RGROWTH(-1)	0.636455 (0.10332) [6.15978]
RGROWTH(-2)	0.075549 (0.12861) [0.58741]
RGROWTH(-3)	-0.349118 (0.10660) [-3.27500]
C	-75.58524 (18.7616) [-4.02872]
CONT_CADG(-1)	0.058018 (0.02877) [2.01650]
INFLATION	-0.101126 (0.05346) [-1.89151]
INFLATION(-1)	0.074384 (0.05419) [1.37261]
LLANDT_INVEST_SA	0.574674 (1.65406) [0.34743]
LLANDT_INVEST_SA(-1)	6.510477 (1.86618) [3.48867]
DUMDEC02	1.069724 (0.95694) [1.11786]
DUMMAR09	-3.819537 (1.02651) [-3.72088]
LAMPREFORM	0.750245 (0.99114)

Figure 30: LAMP Reform VAR Model

	[0.75695]
LAMPREFORM(-1)	-1.032969
	(1.32824)
	[-0.77770]
LAMPREFORM(-2)	0.553996
	(0.97093)
	[0.57058]
R-squared	0.767258
Adj. R-squared	0.722099
Sum sq. resids	56.13603
S.E. equation	0.915342
F-statistic	16.99018
Log likelihood	-100.0838
Akaike AIC	2.816885
Schwarz SC	3.230740
Mean dependent	0.762746
S.D. dependent	1.736354

Figure 31: LAMP Reform Johansen Cointegration Test

Land Titling Reform Test of Cointegrating Relationship

Date: 09/16/21 Time: 19:14
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Trend assumption: Linear deterministic trend
Series: RGROWTH CONT_CADG LLANDT_INVEST_SA
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.268085	39.39061	29.79707	0.0029
At most 1	0.101273	13.79913	15.49471	0.0886
At most 2 *	0.059652	5.043470	3.841465	0.0247

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.268085	25.59148	21.13162	0.0110
At most 1	0.101273	8.755658	14.26460	0.3071
At most 2 *	0.059652	5.043470	3.841465	0.0247

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

RGROWTH	CONT_CADG	LLANDT_INVEST_SA
-0.849094	0.148259	10.88586
-0.033575	0.079882	-7.381652
-0.119512	-0.180603	-5.640937

Unrestricted Adjustment Coefficients (alpha):

D(RGROWTH)	0.466043	0.176707	0.057178
D(CONT_CADG)	-0.229527	-0.439070	0.808166
D(LLANDT_INVEST_SA)	-0.015622	0.019792	-0.003292

1 Cointegrating Equation(s): Log likelihood -220.4091

Figure 32: LAMP Reform Johansen Cointegration Test

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	LLANDT_INVEST_SA
1.000000	-0.174609	-12.82056
	(0.04727)	(2.33413)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.395714
	(0.09462)
D(CONT_CADG)	0.194890
	(0.34884)
D(LLANDT_INVEST_SA)	0.013264
	(0.00665)

2 Cointegrating Equation(s): Log likelihood -216.0313

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	LLANDT_INVEST_SA
1.000000	0.000000	-31.24900
		(8.16673)
0.000000	1.000000	-105.5412
		(44.8239)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.401647	0.083211
	(0.09313)	(0.01846)
D(CONT_CADG)	0.209632	-0.069103
	(0.34651)	(0.06867)
D(LLANDT_INVEST_SA)	0.012600	-0.000735
	(0.00637)	(0.00126)

Figure 33: LAMP Test of Weak Exogeneity and Granger Causality

Land Titling Reform: Test of Weak Exogeneity in Transmission Variables

Vector Error Correction Estimates
Date: 09/16/21 Time: 19:16
Sample (adjusted): 3/01/2000 12/01/2019
Included observations: 80 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegration Restrictions:
A(2,1)=0
Convergence achieved after 5 iterations.
Not all cointegrating vectors are identified
LR test for binding restrictions (rank = 1):

Chi-square(1)	2.967073
Probability	0.084975

Cointegrating Eq:	CointEq1
RGROWTH(-1)	0.981715
LLANDT_INVEST_SA(-1)	-7.038219
C	75.44286

Land Titling Reform: Granger Causality Test (Z and Y) Causal Relationship

Pairwise Granger Causality Tests
Date: 09/16/21 Time: 19:18
Sample: 12/01/1998 12/01/2019
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LLANDT_INVEST_SA does not Granger Cause RGROWTH	82	5.43426	0.0062
RGROWTH does not Granger Cause LLANDT_INVEST_SA		2.69197	0.0741

Figure 34: AMANDA Reform Model Specification

Application Management and Data Automation System (AMANDA) Reform

AMANDA Full Model Specification Tests

VAR Lag Order Selection Criteria
Endogenous variables: RGROWTH
Exogenous variables: C CONT_CADG(-2) DLAMANDA_HSPIOJ_SA DUMSEPT07 DU...
Date: 09/16/21 Time: 19:31
Sample: 12/01/1998 12/01/2019
Included observations: 80

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-153.0067	NA	3.119188	3.975168	4.153820	4.046794
1	-115.2189	68.96267*	1.243643*	3.055474*	3.263901*	3.139038*
2	-115.1128	0.190996	1.272031	3.077821	3.316024	3.173323
3	-114.5395	1.017687	1.286039	3.088487	3.356465	3.195927
4	-114.5394	0.000111	1.319065	3.113486	3.411239	3.232863

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

VAR Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: Residuals are multivariate normal
Date: 09/16/21 Time: 19:32
Sample: 12/01/1998 12/01/2019
Included observations: 83

Component	Skewness	Chi-sq	df	Prob.*
1	-0.417869	2.415500	1	0.1201
Joint		2.415500	1	0.1201

Component	Kurtosis	Chi-sq	df	Prob.
1	3.941750	3.067175	1	0.0799
Joint		3.067175	1	0.0799

Component	Jarque-Bera	df	Prob.
1	5.482674	2	0.0645
Joint	5.482674	2	0.0645

*Approximate p-values do not account for coefficient estimation

VAR Residual Serial Correlation LM Tests
Date: 09/16/21 Time: 19:34
Sample: 12/01/1998 12/01/2019
Included observations: 83

Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	0.019061	1	0.8902	0.019191	(1, 75.0)	0.8902
2	1.591295	1	0.2071	1.619206	(1, 75.0)	0.2071
3	0.737454	1	0.3905	0.746090	(1, 75.0)	0.3905
4	2.978811	1	0.0844	3.059562	(1, 75.0)	0.0844

Null hypothesis: No serial correlation at lags 1 to h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	0.019061	1	0.8902	0.019191	(1, 75.0)	0.8902
2	1.831563	2	0.4002	NA	(2, NA)	NA
3	1.949311	3	0.5830	0.653984	(3, 73.0)	0.5830
4	5.618563	4	0.2295	1.440108	(4, 72.0)	0.2296

*Edgeworth expansion corrected likelihood ratio statistic.

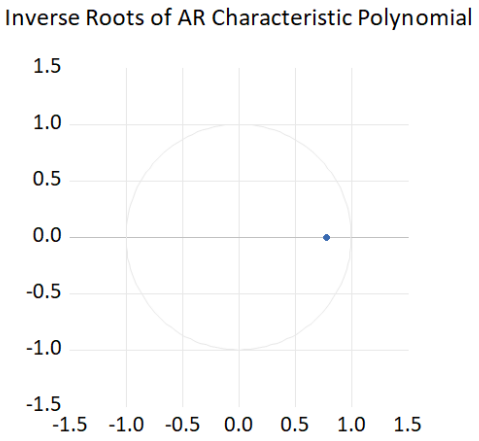


Figure 35: AMANDA Reform VAR Model

AMANDA VAR Specification Results

Vector Autoregression Estimates
Date: 09/16/21 Time: 19:30
Sample (adjusted): 6/01/1999 12/01/2019
Included observations: 83 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	RGROWTH
RGROWTH(-1)	0.775089
	(0.07142)
	[10.8518]
C	0.485370
	(0.25102)
	[1.93360]
CONT_CADG(-2)	0.044005
	(0.02403)
	[1.83119]
DLAMANDA_HSPIOJ_SA	-0.273259
	(0.56705)
	[-0.48190]
DUMSEPT07	-1.225817
	(1.08622)
	[-1.12852]
DUMMAR11	2.019601
	(1.10732)
	[1.82386]
AMANDAREFORM	0.227604
	(0.36065)
	[0.63109]
R-squared	0.649034
Adj. R-squared	0.621326
Sum sq. resids	84.72260
S.E. equation	1.055827
F-statistic	23.42422
Log likelihood	-118.6244
Akaike AIC	3.027094
Schwarz SC	3.231092
Mean dependent	0.759479
S.D. dependent	1.715775

Figure 36: AMANDA Reform Johansen Cointegration Test

AMANDA Test of Cointegrating Relationship

Date: 09/16/21 Time: 19:35
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Trend assumption: Linear deterministic trend
Series: RGROWTH CONT_CADG CONT_INVGDP_SA LAMANDA_HSPIOJ_SA
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.260751	49.00790	47.85613	0.0388
At most 1	0.155166	24.23404	29.79707	0.1907
At most 2	0.088792	10.40758	15.49471	0.2507
At most 3	0.033368	2.782902	3.841465	0.0953

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.260751	24.77386	27.58434	0.1099
At most 1	0.155166	13.82646	21.13162	0.3795
At most 2	0.088792	7.624681	14.26460	0.4181
At most 3	0.033368	2.782902	3.841465	0.0953

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

RGROWTH	CONT_CADG	CONT_INVGDP_SA	LAMANDA_HSPIOJ_SA
0.673352	-0.176074	-31.33483	0.667665
-0.373445	-0.093489	11.53330	1.094976
-0.162242	-0.007667	-32.91961	1.114621
0.037288	0.126870	4.261272	1.490839

Unrestricted Adjustment Coefficients (alpha):

D(RGROWTH)	-0.487743	0.118722	0.120473	0.002440
D(CONT_CADG)	0.490412	0.371010	0.137599	-0.583729
D(CONT_INVGDP_SA)	0.002367	-0.002387	0.004225	0.001848
D(LAMANDA_HSPIOJ_SA)	-0.042597	-0.069700	-0.004818	-0.012723

Figure 37: AMANDA Reform Johansen Cointegration Test

1 Cointegrating Equation(s): Log likelihood -99.48372

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	LAMANDA_HSPI OJ_SA
1.000000	-0.261489	-46.53561	0.991554
	(0.06164)	(11.3950)	(0.64765)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.328422
	(0.07444)
D(CONT_CADG)	0.330220
	(0.26749)
D(CONT_INVGDP_SA)	0.001594
	(0.00146)
D(LAMANDA_HSPIOJ_SA)	-0.028683
	(0.01575)

2 Cointegrating Equation(s): Log likelihood -92.57050

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	LAMANDA_HSPI OJ_SA
1.000000	0.000000	-38.53915	-1.012992
		(14.7532)	(0.88069)
0.000000	1.000000	30.58049	-7.665892
		(56.7476)	(3.38753)

Adjustment coefficients (standard error in parentheses)

D(RGROWTH)	-0.372759	0.074779
	(0.08448)	(0.02187)
D(CONT_CADG)	0.191668	-0.121034
	(0.30412)	(0.07874)
D(CONT_INVGDP_SA)	0.002485	-0.000194
	(0.00165)	(0.00043)
D(LAMANDA_HSPIOJ_SA)	-0.002654	0.014016
	(0.01692)	(0.00438)

3 Cointegrating Equation(s): Log likelihood -88.75816

Normalized cointegrating coefficients (standard error in parentheses)

RGROWTH	CONT_CADG	CONT_INVGDP_SA	LAMANDA_HSPI OJ_SA
1.000000	0.000000	0.000000	-1.895361
			(0.97042)
0.000000	1.000000	0.000000	-6.965740
			(3.16333)
0.000000	0.000000	1.000000	-0.022895
			(0.01925)

Adjustment coefficients (standard error in parentheses)

Figure 38: AMANDA Reform Johansen Cointegration Test

D(RGROWTH)	-0.392304	0.073856	12.68667
	(0.08564)	(0.02171)	(5.10342)
D(CONT_CADG)	0.169344	-0.122089	-15.61773
	(0.31055)	(0.07873)	(18.5049)
D(CONT_INVGDP_SA)	0.001799	-0.000226	-0.240776
	(0.00165)	(0.00042)	(0.09807)
D(LAMANDA_HSPIOJ_SA)	-0.001872	0.014053	0.689525
	(0.01729)	(0.00438)	(1.03016)

Figure 39: AMANDA Test of Weak Exogeneity and Granger Causality

AMANDA Reform: Test of Weak Exogeneity in Transmission Variables

Vector Error Correction Estimates
Date: 09/16/21 Time: 19:42
Sample (adjusted): 9/01/1999 12/01/2019
Included observations: 82 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegration Restrictions:
A(2,1) = 0
Convergence achieved after 4 iterations.
Not all cointegrating vectors are identified
LR test for binding restrictions (rank = 1):

Chi-square(1)	0.105889
Probability	0.744874

Cointegrating Eq:	CointEq1
RGROWTH(-1)	-0.770865
LAMANDA_HSPIOJ_SA(-1)	-0.108073
C	1.330926

AMANDA Reform: Granger Causality Test (Z and Y) Causal Relationship

Pairwise Granger Causality Tests
Date: 09/16/21 Time: 19:43
Sample: 12/01/1998 12/01/2019
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LAMANDA_HSPIOJ_SA does not Granger Cause RGROWTH	82	0.19175	0.8259
RGROWTH does not Granger Cause LAMANDA_HSPIOJ_SA		1.11235	0.3340