MINISTRY OF LABOUR & SOCIAL SECURITY

Jamaica Productivity Centre

# Tracking monetary policy, firm entry and productivity in Jamaica and other small-island states

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**Abstract**

This study aims to compare the evolution of firm entry in small island developing states, with an emphasis on the Jamaican case. It also investigates the relationship between monetary policy, firm entry, and productivity in those states, with a focus on Jamaica, Mauritius, Trinidad & Tobago, St. Lucia, and Suriname from 2006 to 2020. While some evidence suggests that lower interest rates and increased money supply can incentivize new firm entry, the impact on productivity is less clear, with a tendency for labor productivity to decrease with lower interest rates. Notably, firm entry growth outpaces labor productivity in Jamaica, Suriname, and Trinidad & Tobago, consistent with the "overshooting" mechanism proposed by previous models. However, this relationship is not consistently observed in Mauritius and St. Lucia, highlighting the complexity of the interdependence between monetary policy and economic outcomes.

**Keywords**: monetary policy, interest, money supply, firm entry, productivity, small-island developing state

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# Introduction

Central banks, like other core government institutions, have a mandate to facilitate growth and development. Hence, productivity improvement must hold a central place in the outlook of any monetary policy developing states create and implement. The canonical "classical dichotomy" suggests monetary policy would not impact economic activity—productivity included—in the long-term. Yet, it still stands to reason to explore the amount and manner of influence central banks and monetary policy have on productivity growth.

Figure 1: Total factor productivity and labour productivity growth in Jamaica

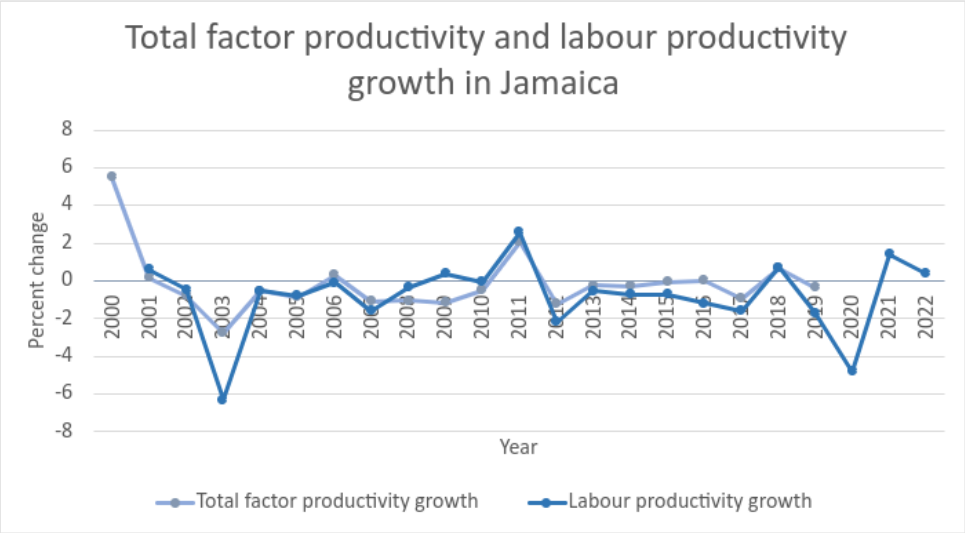


Figure 1: Total factor productivity and labour productivity growth in Jamaica (Source: Bank of Jamaica, 2023; World Bank, 2023)

In Jamaica, both labour productivity and total factor productivity remain stagnant in the long term, with periodic post-recovery growth punctuating the overall trend (Figure 1). Meanwhile, from Figure 2, growth in broad money supply has generally declined; yet the policy interest rate has remained mostly stable except for the post-COVID recovery period.

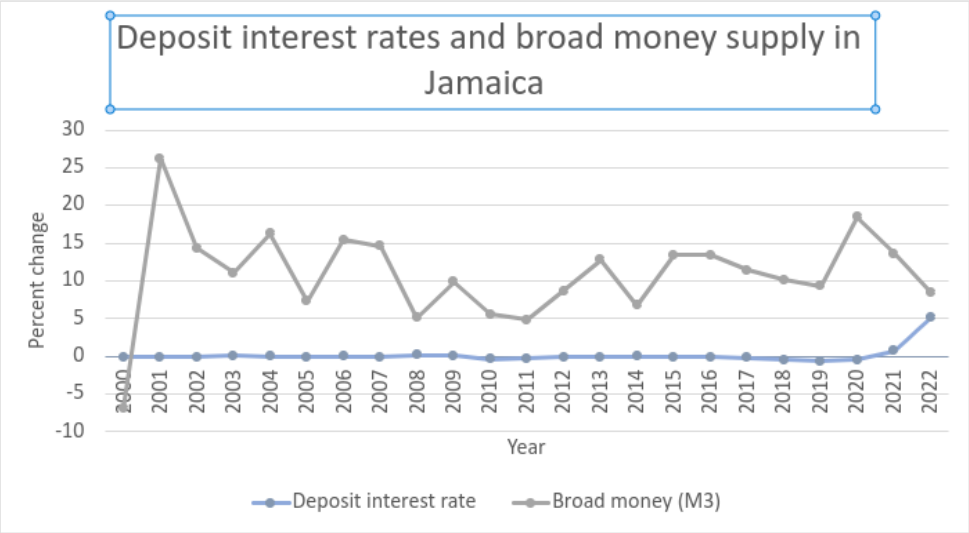


Figure 2: Deposit interest rates and broad money in Jamaica (Source: Bank of Jamaica, 2023; World Bank, 2023)

The prospects of monetary policy inducing productivity growth are mixed in recent literature. Moran and Queralto (2018) studied the influence of monetary policy on total factor productivity (TFP). The authors were concerned with the emergence of a low-productivity era following recovery from the late-2000s recession in the United States. Given the 1.75% decline in total factor productivity from 2009 to 2015 they observed being associated with the Federal Reserve temporarily setting interest rates to zero, Moran and Queralto tested the relationship between monetary policy and TFP. They found that, solidifying their observations, monetary policy had a causal impact on TFP, with the latter decreasing with loosening of monetary policy up to the zero-lower bound.

The findings above imply a transmission mechanism from monetary policy to productivity. One possible route is entry of less productive firms. Bergin and Corsetti (2008) assert that any monetary policy that eases uncertainty over productivity shocks (i.e., whether firms can stay competitive) will induce firm entry. In the context of giving incentives for implementing stabilisation policy, they also attribute positive welfare effects to such policy, while cautioning that reformers should also be concerned with the level of market entrants and setting a target level of production per firm.

Citing Bergin and Corsetti, Colciago and Silvestrini (2020) lay out the theoretical case for a similar mechanism reducing total factor productivity in the short-term, and not just when interests are zeroed out. For the authors, discount factors firms face decrease with the real interest rate. In this manner, decreasing the real interest rate increases the discount factor, then the discount for accruing future profit, incentivising firm entry. Additionally, at a more basic level, a decreasing real interest rate reduces variable costs. Given its association with effectiveness and efficiency of each act of production, the level of *variable costs* is central to productivity. That is, with lower variable costs, a higher level of (low-productivity) firms may enter, and vice versa. What is salient here for the authors is that loosening (and tightening) of monetary policy perturbs firm entry and exit. Notably, the model Colciago and Silvestrini develop predicts a short-term decline in labour productivity with monetary easing, with a

competition effect pushing less-productive firms out of the market in the medium-term, resulting in labour productivity "overshooting" levels pre-intervention.

Hartwig and Lieberknecht (2022) reach similar conclusions in their testing of this mechanism with data from the United States from 1993 to 2017. Developing a structural vector autoregression (SVAR) model, the authors observe an expansionary monetary policy shock increasing corporate profits and firm entry in the short run. Then, in the medium-run, firm exit overshoots its baseline. The 2022 paper also delves into the matter of the firm exit channel, concluding that profitability driven by monetary loosening inhibits firm exit.

The importance of the medium run emerges also in Ebenezer et al. (2022). The research behind this paper was done to study the relationship in oil-exporting African countries (OEACs) between oil prices (as a general internal shock), monetary policy and productivity. In fact, rather than productivity in itself, the authors made use of the growth rates of the manufacturing sectors in these oil exporting countries. The paper found that in the region, there was a weak long-run association between monetary policy and manufacturing growth rates, with monetary expansion inducing additional manufacturing growth in the short short-run. That is, monetary policy was found to have a transitory impact on growth. The authors also suggest that in OEACs, increasing money supply may have a greater impact than changing interest rates.

Doorasamy and Wilfred (2020) explored the interdependence between labour productivity, monetary supply and human capital in South Africa between 1980 and 2016. The authors were concerned with how fast labour productivity responds to changes in human capital and money supply, how money supply responds to human capital and labour productivity, as well as any blockages that arise due to any interdependence. From its VAR model, the paper concluded that labour productivity responded more to human capital than to money supply and found no effect of monetary policy on human capital.

## Data and method

This paper makes use of a panel of data for Jamaica, Trinidad & Tobago, Mauritius, St. Lucia, and Suriname from the years 2006 to 2020 containing four variables: policy interest rate *i*, money supply *M*, number of new firms $\Delta N$, and labour productivity *LP*. For Jamaica, Mauritius and Trinidad & Tobago, total factor productivity *TFP* is also included. The interest rate and money supply are taken from World Bank Open Data, with money supply taken as broad money (M3). Labour productivity (measured as GDP per person employed) are also taken from World Bank Open Data. Total factor productivity data is taken from the Conference Board. Data on new firms, as a measure of firm entry, are taken from the World Bank Entrepreneurship Database. Additional employment data come from the Central Bank of Trinidad & Tobago, Central Statistical Office of St. Lucia, and data tabulated in Baca Campodonico, J., & Reyes-Tagle, G. (2023). All data is tabulated in Appendix A.

The regression method presented involves three ordinary least squares regression models. Equation 1 regresses percent changes on policy interest rates and money supply with no lag ($\beta_1 i_t$, $\beta_4 M_t$ respectively), 1 year lag ($\beta_2 i_{t-1}$, $\beta_5 M_{t-1}$) and 2-year lags ($\beta_3 i_{t-2}, \beta_6 M_{t-2}$ respectively) against percent changes to new firm entry $\Delta N_t$. Similarly, equation 2 regresses percent changes to

policy interest rates and money supply against labour productivity growth $LP_t$., and equation 3 regresses these independent variables against total factor productivity $TFP_t$.

$$\widehat{\Delta N_t} = \widehat{\beta_0} + \widehat{\beta_1} i_t + \widehat{\beta_2} i_{t-1} + \widehat{\beta_3} i_{t-2} + \widehat{\beta_4} M_t + \widehat{\beta_5} M_{t-1} + \widehat{\beta_6} M_{t-2} + \Sigma\widehat{FE} + \epsilon \text{ (Equation 1)}$$

$$\widehat{\Delta LP_t} = \widehat{\gamma_0} + \widehat{\gamma_1} i_t + \widehat{\gamma_2} i_{t-1} + \widehat{\gamma_3} i_{t-2} + \widehat{\gamma_4} M_t + \widehat{\gamma_5} M_{t-1} + \widehat{\gamma_6} M_{t-2} + \Sigma\widehat{FE} + \epsilon \text{ (Equation 2)}$$

$$\widehat{TFP_t} = \widehat{\eta_0} + \widehat{\eta_1} i_t + \widehat{\eta_2} i_{t-1} + \widehat{\eta_3} i_{t-2} + \widehat{\eta_4} M_t + \widehat{\eta_5} M_{t-1} + \widehat{\eta_6} M_{t-2} + \Sigma\widehat{FE} + \epsilon \text{ (Equation 3)}$$

Each equation also accounts for country-specific fixed effects present in each country, with dummy variables for Trinidad and Tobago, Mauritius, St. Lucia and Suriname, such that $\sum FE = \widehat{TTO} + \widehat{MUS} + \widehat{LUC} + \widehat{SUR}$.

## Movement of variables

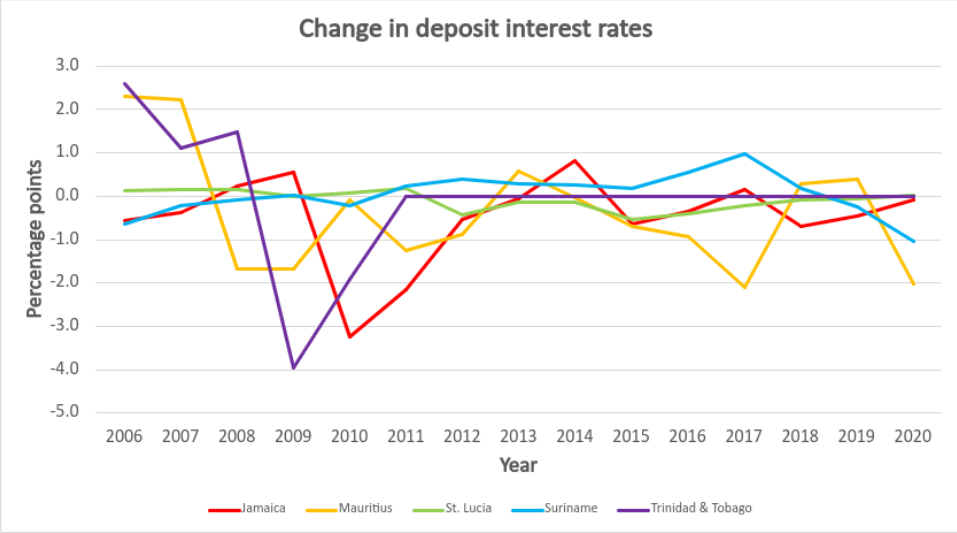


Figure 3: Change in deposit interest rates (Source: World Bank Open Data)

In response to an economic shock, central banks may adjust interest rates towards the purpose of stabilisation, indirectly tempering inflation expectations and inflation itself. This may be expressed as movements of the deposit interest rate. This is the rate paid to privately-held certificates of deposits; that is, the rate at which monetary authorities lend to the banking sector and other private entities. See Appendix A for deposit interest rate data corresponding to each country, and Figure 3 for a line chart comparing interest rate behaviour.

For the period covered, 2006 to 2020, Jamaica, Mauritius and Trinidad & Tobago faced significant decreases in deposit rates after the late-2000s recession, adjusting the most at different times. Mauritius had the earliest characteristic decline at 3.9 percentage points in 2008 from an annual average of 2.2 percent one year prior to -1.7 percent. The Central Bank of Trinidad & Tobago imposed a similar decline in 2009, from 1.5 percent to -4.0 percent, a 5.5-point drop. In 2010, the annual average deposit interest rate in Jamaica moved 3.8 points from 0.6 percent in 2009 to -3.2 percent in 2010.

Deposit interest rates in Saint Lucia and Suriname remained relatively stable throughout the entire 2006 to 2020 period, with ranges of deposit interest rates of 0.7 points and 2 points, respectively; this compares to 4 points for Jamaica, 4.4 points for Mauritius, and 6.6 points for Trinidad and Tobago.

Notably, before the late-2000s, interest rates in Trinidad & Tobago varied year-to-year. However, starting in 2011, the deposit interest rate in Trinidad & Tobago was set to zero. Compared to this case, St. Lucian and Surinamese deposit interest rates remained within 1 percentage point of the origin, Suriname exactly so (from -1.0 percent in 2020 to 1.0 percent in 2017), and St. Lucia between -0.5 percent and 0.2 percent. Hence, while Jamaica and Mauritius stand out as examples where deposit interest rates routinely vary in either direction, St. Lucia, Suriname and Trinidad & Tobago form a group close to or precisely at the zero mark.

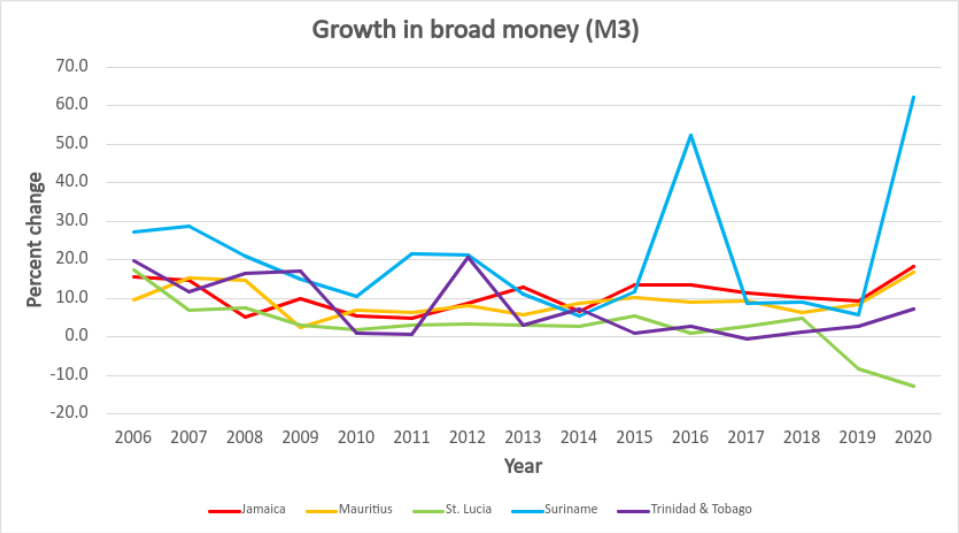


Figure 4: Growth in broad money (M3) (Source: World Bank Open Data)

In addition to adjusting interest rates, central banks may intervene to stabilise a national economy through expansion or contraction of the money supply. The money supply can be measured to include differing money aggregates. This paper makes use of broad money (M3), generally understood to include all checkable deposits in its scope in addition to money in circulation. With the exceptions of Saint Lucia post-2018 and Trinidad and Tobago in 2017, the central banks of the comparator countries in the period studied engaged in routine monetary expansion.

Suriname and Trinidad & Tobago stand out for periods of rapid monetary expansion. For Suriname, growth in M3 accelerated immensely from 11.8 percent in 2015 to 52.2 percent in 2016, and once more from 5.7 percent in 2019 to 62.1 percent in 2020, amidst the start of the COVID-19 pandemic.

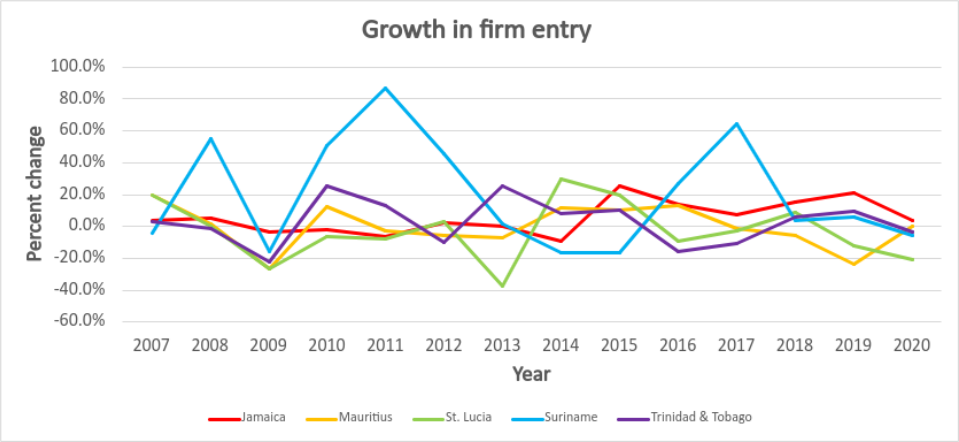


Figure 5: Growth in firm entry (Source: World Bank Entrepreneurship Database and calculations by JPC)

Firm entry is central to the transmission mechanism asserted in Bergin and Corsetti (2008) and Colciago and Silvestrini (2020). If such a mechanism exists, whatever its characteristics, faster or slower firm entry should be apparent in the data. As shown in Figure 5 amd Table 6, in most of the comparator countries, there were more periods of positive firm entry growth than negative growth. This, for example, led to a 5.6 percent average annual firm entry growth rate for Jamaica, between 2006 and 2015. In that period, Jamaica had 10 years of positive growth out of 15, including in 2020 at the beginning of the COVID-19 pandemic. The maximum growth rate in Jamaica of 25.5 percent was below that of three other comparators, only exceeding that of Mauritius at 20 percent. The peak growth rate was 29.5 percent for St. Lucia, 86.9 percent for Suriname and 25.8 percent for Trinidad & Tobago.

In Suriname, bouts of firm entry growth peaking at 55.0 percent in 2008, 86.9 percent in 2011, and 64.4 percent in 2017 resulted in an average growth rate of 20.1 percent. Mixed prospects for Trinidad & Tobago resulted in 2.7 percent annual average growth in firm entry.

Across the 15-year period, firm entry in Mauritius declined by 0.3 percent per year. Among the comparator countries, it had the fewest years of positive firm entry growth, at 7 out of 15 (the same as St. Lucia). Of possible relevance is Mauritius' place on the Eurostat list of offshore financial centres, with the behaviour of economic agents foreign to Mauritius distorting firm opening, closure, entry and exit in Mauritian markets.

Meanwhile, St. Lucia had even lower firm entry growth over the 2006 to 2020 period. In contrast to the other comparators, there was a decline of 3.1 percent on average per year. This is despite a peak of 29.5 percent growth in 2014. 8 years of negative growth depressed this annual average rate. Firm entry was its slowest for St. Lucia in 2013, with a decline of 37.5 percent.

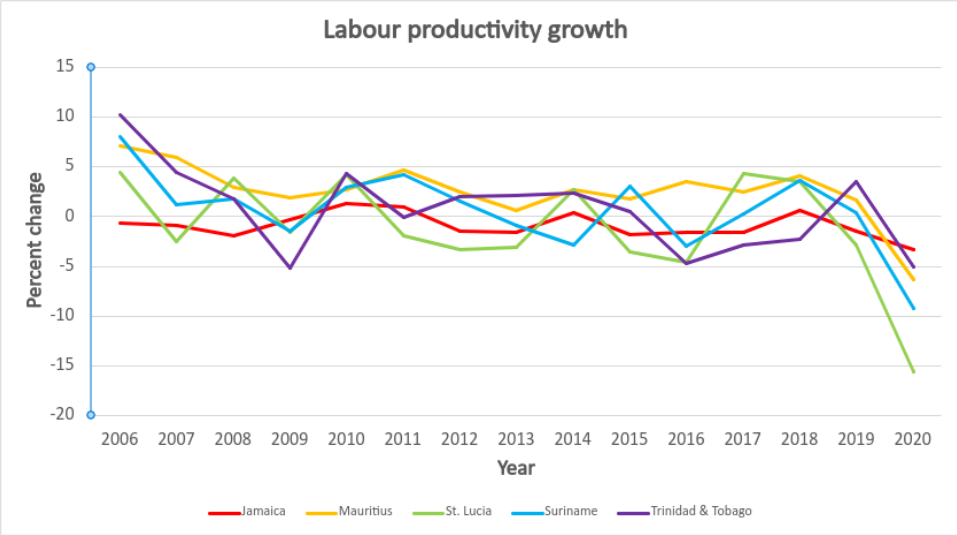


Figure 6: Labour productivity growth (Source: calculated by JPC)

Labour productivity, measured as the value added per worker or hour worked, is central to tracking the performance and potential of a national economy. All else equal, labour productivity captures how effectively and efficiently a workforce makes use of inputs, capital and other factors of production.

From the 2006 to 2020 period studied, labour productivity varied across the comparator countries. In the case of Jamaica, per Figure 6, labour productivity declined at an average rate of 0.9 percent per year. Saint Lucia also had negative labour productivity growth throughout this period, with a similar average decline of 1.0 percent per year. Neither country sustained labour productivity growth for more than two consecutive years. Jamaica and St. Lucia had 4 and 6 years of positive labour productivity growth, respectively. Caribbean comparators Suriname and Trinidad & Tobago each had positive productivity growth throughout the period taken as a whole, with an average rate of 0.7 percent per year.

Mauritius stands out among the comparators. It had the highest annual average labour productivity growth rate among all five countries, at 2.5 percent per year. Additionally, except in 2020, marking the beginning of the COVID-19 pandemic and recession, Mauritius continually sustained productivity growth year after year.

From Figure 7, differences in the evolution of labour productivity and firm growth emerge. In the case of Jamaica, while labour productivity declined at an average rate of 0.9 percent per year between 2006 and 2020, firm entry increased by 5.6 percent per year in the same period. In Suriname, firm entry also outpaced labour productivity, with 20.1 percent per year and 0.7 percent growth per year respectively. This was also the case in Trinidad & Tobago, where labour productivity rose at an average rate of 0.7 percent per year, while firm entry grew by 2.7 percent per year. However, in the case of Mauritius, labour productivity increased at an average rate of 2.5 percent per annum, as opposed to firm entry, which decreased at 0.3 percent per year. In Saint Lucia, both labour productivity and firm entry rates decreased at 1.0 percent and 3.1 percent, respectively.

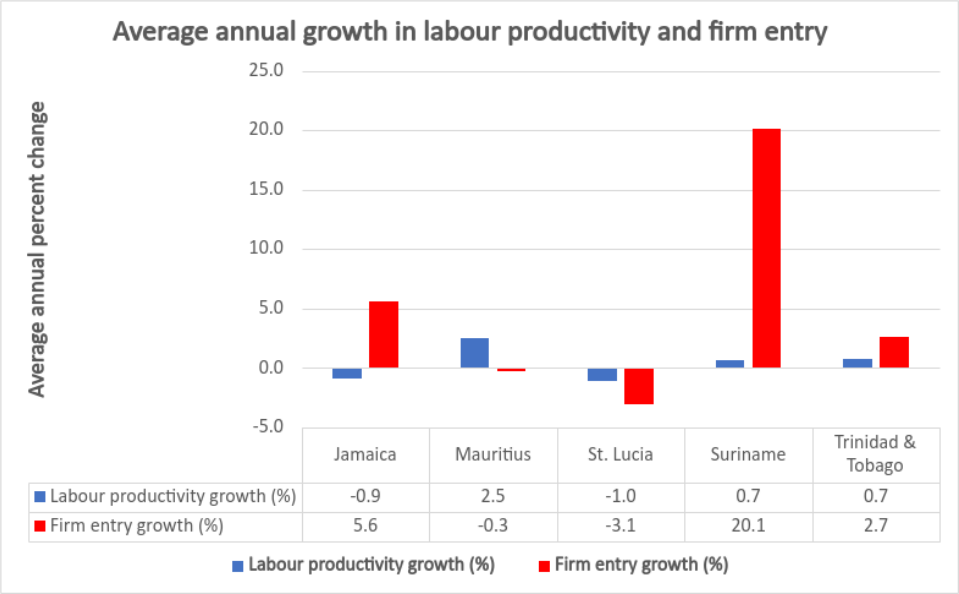


Figure 7: Average annual growth in labour productivity and firm entry (Source: calculated by JPC)

For three comparator countries, Jamaica, Mauritius and Trinidad & Tobago, total factor productivity is included in the analysis. Unlike labour productivity, total factor productivity is observed as a residual value after labour and capital productivity are measured. In the case of Jamaica, per Conference Board data included in Appendix A, total factor productivity remained mostly stagnant to decreasing in the 2006 to 2020 period, with an average decline of 1.5 percent per year; only in 2011 was total factor productivity positive in the data set for Jamaica. Meanwhile, for Mauritius, its total factor productivity evolution revealed a moderate decline of 0.4 percent per year on average. Unlike Jamaica, Mauritius had mostly years of positive growth, including sustained growth from 2014 to 2018. In Trinidad & Tobago, total factor productivity declined the furthest among the comparators at 1.9 percent per year.

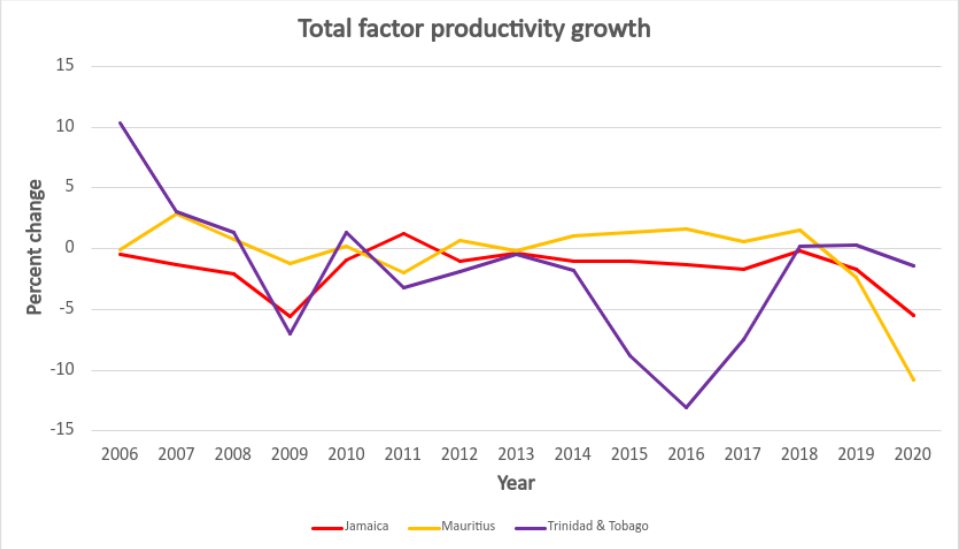


Figure 8: Total factor productivity growth (Source: Conference Board)

## Model results

Results from generating the OLS models specified in equations 1, 2 and 3 indicate mixed results on the direction and significance of the impact of monetary policy on firm entry and labour productivity.

From Table 7 in Appendix B, at 5% significance level, only contemporaneous changes in interest rate ($\beta_1 = -0.456, p = 0.008$ ) and expansion of money supply with a one-year lag ($\beta_5 = 0.982,\ p = 0.025$) are significantly correlated with new firm entry. In the case of labour productivity, Table 8 shows that contemporaneous changes in interest rate ($\gamma_1 = -0.095, p = 0.010$ ) and two-year lag ($\gamma_3 = -0.116,\ p = 0.009$ ) are significant at the 5% significance level. Neither deposit interest rates nor money supply had a significant correlation with total factor productivity per results in table 9.

## Conclusions and limitations

The full overshooting mechanism proposed in Colciago and Silvestrini (2020) is not fully demonstrated from the small island developing state data above. From the model on firm entry, reductions in interest rate in the same period and one-year lags in increases in money supply are associated with accelerations in new firm entry. These findings are optimistic for the overshooting model, as both monetary policy actions conceptually incentivise the entry of new firms. However, the predicted effect on labour productivity is not demonstrated. Labour productivity is shown to decrease with interest rates in the current period as well as with two-year lags; the direction of this trend does not change in the medium run. None of the independent variables were significantly correlated with total factor productivity.

Positive firm entry growth was sustained in three of the small-island comparators: Jamaica at 5.6 percent per year, Suriname at 20.1 percent per year and Trinidad & Tobago at 2.7 percent per year. In contrast, Mauritius and St. Lucia declined in annual firm entry, with average declines of 0.3 percent and 3.1 percent, respectively.

Notably, in three comparator countries - Jamaica, Suriname and Trinidad & Tobago - firm entry growth outpaced labour productivity growth. Were the dynamic illustrated the transmission mechanism modeled in Colciago and Silvestrini (2020) and Hartwig and Lieberknecht (2022) to exist, these outcomes would be expected. However, the existence of counterexamples in Mauritius and St. Lucia, where labour productivity grew faster than firm entry, would complicate such a conclusion.

# References

Baca Campodonico, J., & Reyes-Tagle, G. (2023). Econometric estimation of the capital stock and the production function: the case of the Bahamas, Barbados, Jamaica, and Suriname. *Barbados, Jamaica, and Suriname*. http://dx.doi.org/10.18235/0004749

Bank of Jamaica. (2023). Bank of Jamaica Policy Rates [Data set]. https://boj.org.jm/statistics/interest-rates/bank-of-jamaica-rates/

Bergin, P., & Corsetti, G. (2008). The extensive margin and monetary policy. *Journal of monetary economics*, *55(7)*. https://doi.org/10.1016/j.jmoneco.2008.08.011

Central Bank of Trinidad &Tobago. (2023). Labour force annual [Data set]. https://www.central-bank.org.tt/statistics/data-centre/labour-force-annual

Central Statistical Office of Saint Lucia. (2023). Main labour force indicators, (annual) 1994 to 2021 [Data set]. https://stats.gov.lc/subjects/society/labour-force/main-labour-force-indicators-annual-1994-to-2021/

Colciago, A., & Silvestrini, R. (2022). Monetary policy, productivity, and market concentration. *European Economic Review*, *142*, 103999. https://doi.org/10.1016/j.euroecorev.2021.103999

Ebenezer, O., Ogujiuba, K., Maredza, A., & Adeleke,O. (2022). Monetary policy and productivity nexus for oil exporting African countries a econometric analysis. *Acta Universitatis Danubius. Œconomica*, *18*(1), 21–42. https://www.ceeol.com/search/article-detail?id=879573

Hartwig, B., & Lieberknecht, P. (2020). Monetary Policy, Firms' Extensive Margin and Productivity. (Deutsche Bundesbank Discussion Paper # 61/2020). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3747469

Doorasamy, M., & Wilfred, A. G. (2020). Monetary Policy, Human Capital and Productivity in South Africa: an Empirical Analysis. *Acta Universitatis Danubius. Œconomica*, *16*(1), 284–307. https://www.ceeol.com/search/article-detail?id=879573

Moran, P., & Queralto, A. (2018). Innovation, productivity, and monetary policy. *Journal of Monetary Economics*, *93*, 24–41. https://doi.org/10.1016/j.jmoneco.2017.10.006

World Bank. (2023a). World Bank Entrepreneurship Database [Data set]. https://www.worldbank.org/en/programs/entrepreneurship

World Bank. (2023b). World Bank Open Data [Data set]. https://data.worldbank.org/

# Appendix A – Country data

| Table 1: Data for Jamaica | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Year** | **Deposit interest rate (%)** | **M3 growth (%)** | **Output (million USD)** | **Employment (persons)** | **Firm entry (firms)** | **LP growth (%)** | **TFP (% change natural log)** |
| **2006** | 9.3 | 15.5 | 12124.4 | 1099730 | 1,954 | -0.6 | -0.5 |
| **2007** | 8.9 | 14.6 | 12299.5 | 1125470 | 2,024 | -0.9 | -1.3 |
| **2008** | 9.1 | 5.2 | 12198.9 | 1137410 | 2,137 | -1.9 | -2.1 |
| **2009** | 9.7 | 9.9 | 11782.9 | 1102070 | 2,057 | -0.3 | -5.6 |
| **2010** | 6.4 | 5.6 | 11613.8 | 1071590 | 2,020 | 1.4 | -0.9 |
| **2011** | 4.3 | 4.8 | 11779.3 | 1076070 | 1,897 | 1.0 | 1.2 |
| **2012** | 3.8 | 8.7 | 11720.3 | 1086340 | 1,946 | -1.4 | -1 |
| **2013** | 3.7 | 12.8 | 11746.6 | 1106010 | 1,948 | -1.6 | -0.4 |
| **2014** | 4.5 | 6.7 | 11814.1 | 1108560 | 1,775 | 0.3 | -1 |
| **2015** | 3.9 | 13.4 | 11916.8 | 1138800 | 2,227 | -1.8 | -1 |
| **2016** | 3.6 | 13.4 | 12095.3 | 1174500 | 2,544 | -1.6 | -1.3 |
| **2017** | 3.7 | 11.4 | 12177.5 | 1201000 | 2,733 | -1.5 | -1.7 |
| **2018** | 3.0 | 10.2 | 12400.0 | 1215100 | 3,159 | 0.6 | -0.2 |
| **2019** | 2.6 | 9.4 | 12520.3 | 1244900 | 3,819 | -1.4 | -1.7 |
| **2020** | 2.5 | 18.4 | 11278.3 | 1159700 | 3,964 | -3.3 | -5.5 |

| Table 2: Data for Mauritius | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Year** | **Deposit interest rate (%)** | **M3 growth (%)** | **Output (million USD)** | **Employment (persons)** | **Firm entry (firms)** | **LP growth (%)** | **TFP (% change natural log)** |
| **2006** | 9.6 | 9.5 | 7363.9 | 484300 | 7,435 | 7.1 | -0.1 |
| **2007** | 11.8 | 15.3 | 7772.7 | 482600 | 8,888 | 5.9 | 2.8 |
| **2008** | 10.1 | 14.6 | 8184.9 | 493700 | 9,012 | 2.9 | 0.8 |
| **2009** | 8.4 | 2.4 | 8463.4 | 500800 | 6,631 | 1.9 | -1.2 |
| **2010** | 8.4 | 6.9 | 8844.5 | 509600 | 7,442 | 2.7 | 0.2 |
| **2011** | 7.1 | 6.4 | 9188.3 | 505800 | 7,239 | 4.7 | -2 |
| **2012** | 6.2 | 8.2 | 9522.0 | 511700 | 6,817 | 2.4 | 0.7 |
| **2013** | 6.8 | 5.8 | 9847.8 | 525700 | 6,353 | 0.7 | -0.2 |
| **2014** | 6.8 | 8.7 | 10211.0 | 530900 | 7,091 | 2.7 | 1 |
| **2015** | 6.1 | 10.2 | 10542.0 | 538400 | 7,845 | 1.8 | 1.3 |
| **2016** | 5.2 | 9.1 | 10921.8 | 538600 | 8,851 | 3.6 | 1.6 |
| **2017** | 3.1 | 9.3 | 11323.4 | 545100 | 8,757 | 2.4 | 0.6 |
| **2018** | 3.3 | 6.3 | 11760.8 | 544000 | 8,285 | 4.1 | 1.5 |
| **2019** | 3.7 | 8.5 | 12118.2 | 551400 | 6,316 | 1.7 | -2.4 |
| **2020** | 1.7 | 16.9 | 10374.6 | 504000 | 6,312 | -6.3 | -10.8 |

| Table 3: Data for St. Lucia | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Year** | **Deposit interest rate (%)** | **M3 growth (%)** | **Output (million USD)** | **Employment (persons)** | **Firm entry (firms)** | **LP growth (%)** | **TFP (% change natural log)** |
| **2006** | 3.0 | 17.4 | 1420.5 | 66036 | 484 | 4.5 | |
| **2007** | 3.1 | 6.9 | 1442.3 | 68748 | 579 | -2.5 | |
| **2008** | 3.3 | 7.7 | 1516.8 | 69644 | 582 | 3.8 | |
| **2009** | 3.3 | 3.0 | 1496.5 | 69789 | 427 | -1.5 | |
| **2010** | 3.3 | 1.8 | 1513.6 | 67702 | 399 | 4.3 | |
| **2011** | 3.5 | 3.2 | 1557.9 | 71016 | 369 | -1.9 | |
| **2012** | 3.1 | 3.3 | 1576.3 | 74339 | 379 | -3.3 | |
| **2013** | 2.9 | 3.0 | 1539.0 | 74844 | 237 | -3.0 | |
| **2014** | 2.8 | 2.8 | 1570.2 | 74325 | 307 | 2.7 | |
| **2015** | 2.3 | 5.4 | 1572.3 | 77131 | 367 | -3.5 | |
| **2016** | 1.9 | 1.0 | 1602.4 | 82379 | 332 | -4.6 | |
| **2017** | 1.7 | 2.9 | 1658.8 | 81718 | 322 | 4.4 | |
| **2018** | 1.6 | 5.0 | 1710.6 | 81416 | 350 | 3.5 | |
| **2019** | 1.5 | -8.3 | 1714.1 | 83977 | 308 | -2.8 | |
| **2020** | 1.5 | -12.7 | 1292.6 | 75016 | 244 | -15.6 | |

| Table 4: Data for Suriname | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Year** | **Deposit interest rate (%)** | **M3 growth (%)** | **Output (million USD)** | **Employment (persons)** | **Firm entry (firms)** | **LP growth (%)** | **TFP (% change natural log)** |
| **2006** | 6.6 | 27.1 | 3753.5 | 190660 | 114 | 8.0 | |
| **2007** | 6.4 | 28.8 | 3941.8 | 197930 | 109 | 1.2 | |
| **2008** | 6.3 | 20.9 | 4106.1 | 202540 | 169 | 1.8 | |
| **2009** | 6.4 | 14.9 | 4228.9 | 211600 | 142 | -1.4 | |
| **2010** | 6.2 | 10.7 | 4447.5 | 216070 | 214 | 3.0 | |
| **2011** | 6.4 | 21.5 | 4660.7 | 217160 | 400 | 4.3 | |
| **2012** | 6.8 | 21.1 | 4733.5 | 217210 | 583 | 1.5 | |
| **2013** | 7.1 | 11.1 | 4868.6 | 225270 | 592 | -0.8 | |
| **2014** | 7.4 | 5.5 | 4870.2 | 231890 | 495 | -2.8 | |
| **2015** | 7.5 | 11.8 | 4724.5 | 218160 | 412 | 3.1 | |
| **2016** | 8.1 | 52.2 | 4492.4 | 213710 | 523 | -2.9 | |
| **2017** | 9.1 | 8.7 | 4562.9 | 216500 | 860 | 0.3 | |
| **2018** | 9.2 | 9.1 | 4788.6 | 219250 | 890 | 3.6 | |
| **2019** | 9.0 | 5.7 | 4844.6 | 220870 | 946 | 0.4 | |
| **2020** | 7.9 | 62.1 | 4070.7 | 204453 | 892 | -9.2 | |

| Table 5: Data for Trinidad & Tobago | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Year** | **Deposit interest rate (%)** | **M3 growth (%)** | **Output (million USD)** | **Employment (persons)** | **Firm entry (firms)** | **LP growth (%)** | **TFP (% change natural log)** |
| **2006** | 4.8 | 19.7 | 21408.1 | 586200 | 3,421 | 10.2 | 10.3 |
| **2007** | 5.9 | 11.6 | 22420.2 | 587900 | 3,520 | 4.4 | 3 |
| **2008** | 7.4 | 16.4 | 23194.9 | 597700 | 3,470 | 1.8 | 1.3 |
| **2009** | 3.4 | 17.3 | 21663.0 | 588300 | 2,693 | -5.1 | -7 |
| **2010** | 1.5 | 1.0 | 22364.5 | 582200 | 3,372 | 4.3 | 1.3 |
| **2011** | 1.5 | 0.8 | 22470.1 | 585300 | 3,825 | -0.1 | -3.2 |
| **2012** | 1.5 | 20.8 | 24040.6 | 614100 | 3,446 | 2.0 | -1.9 |
| **2013** | 1.5 | 3.2 | 25027.7 | 626300 | 4,334 | 2.1 | -0.5 |
| **2014** | 1.5 | 7.2 | 26040.3 | 636800 | 4,682 | 2.3 | -1.8 |
| **2015** | 1.5 | 1.1 | 25616.3 | 623300 | 5,165 | 0.5 | -8.8 |
| **2016** | 1.5 | 2.8 | 24007.0 | 613000 | 4,341 | -4.7 | -13.1 |
| **2017** | 1.5 | -0.4 | 22938.9 | 603100 | 3,877 | -2.9 | -7.5 |
| **2018** | 1.5 | 1.2 | 22640.0 | 609100 | 4,115 | -2.3 | 0.2 |
| **2019** | 1.5 | 2.9 | 22747.8 | 591100 | 4,511 | 3.5 | 0.3 |
| **2020** | 1.5 | 7.1 | 20811.2 | 569700 | 4,344 | -5.1 | -1.4 |

| Table 6: Firm entry growth rates by country | | | | | |
|---|---|---|---|---|---|
| **Year** | **Jamaica** | **Mauritius** | **St. Lucia** | **Suriname** | **Trinidad & Tobago** |
| **2007** | 3.6% | 19.5% | 19.6% | -4.4% | 2.9% |
| **2008** | 5.6% | 1.4% | 0.5% | 55.0% | -1.4% |
| **2009** | -3.7% | -26.4% | -26.6% | -16.0% | -22.4% |
| **2010** | -1.8% | 12.2% | -6.6% | 50.7% | 25.2% |
| **2011** | -6.1% | -2.7% | -7.5% | 86.9% | 13.4% |
| **2012** | 2.6% | -5.8% | 2.7% | 45.8% | -9.9% |
| **2013** | 0.1% | -6.8% | -37.5% | 1.5% | 25.8% |
| **2014** | -8.9% | 11.6% | 29.5% | -16.4% | 8.0% |
| **2015** | 25.5% | 10.6% | 19.5% | -16.8% | 10.3% |
| **2016** | 14.2% | 12.8% | -9.5% | 26.9% | -16.0% |
| **2017** | 7.4% | -1.1% | -3.0% | 64.4% | -10.7% |
| **2018** | 15.6% | -5.4% | 8.7% | 3.5% | 6.1% |
| **2019** | 20.9% | -23.8% | -12.0% | 6.3% | 9.6% |
| **2020** | 3.8% | -0.1% | -20.8% | -5.7% | -3.7% |

# Appendix B – Model estimates

| **Table 7: Results for firm entry FE OLS model** | | | | | | |
|---|---|---|---|---|---|---|
| **Firm entry FE OLS** | | $R^2$ = 0.355 | SE = 0.218 | Vars: 10 | Obs: 60 | $R^2_{adj}$ = 0.223 |
| | **Coeff.** | **SE** | ***t*-statistic** | ***p*-value** | **Lower 95%** | **Upper 95%** |
| Intercept | -0.031 | 0.103 | -0.300 | 0.765 | -0.239 | 0.177 |
| $i_t$ | -0.456 | 0.164 | -2.772 | 0.008* | -0.786 | -0.125 |
| $i_{t-1}$ | 0.089 | 0.186 | 0.479 | 0.634 | -0.284 | 0.462 |
| $i_{t-2}$ | -0.362 | 0.200 | -1.808 | 0.077 | -0.764 | 0.040 |
| *Mt* | -0.206 | 0.333 | -0.618 | 0.539 | -0.874 | 0.463 |
| *Mt-1* | 0.982 | 0.424 | 2.315 | 0.025* | 0.129 | 1.834 |
| *Mt-2* | -0.429 | 0.441 | -0.972 | 0.336 | -1.316 | 0.458 |
| *TTO* | -0.013 | 0.093 | -0.140 | 0.889 | -0.201 | 0.175 |
| *MUS* | -0.106 | 0.090 | -1.177 | 0.245 | -0.287 | 0.075 |
| *LUC* | -0.067 | 0.106 | -0.630 | 0.532 | -0.281 | 0.147 |
| *SUR* | 0.200 | 0.118 | 1.706 | 0.094 | -0.036 | 0.437 |
| **ANOVA** | | **df** | **SS** | **MS** | **F** | **Sig. F** |
| | **Reg.** | 10 | 1.275 | 0.127 | 2.695 | 0.010 |
| | **Res.** | 49 | 2.318 | 0.047 | | |
| | **Total** | 59 | 3.593 | | | |

(Source: Calculated by JPC)

| **Table 8: Results for labour productivity FE OLS model** | | | | | | |
|---|---|---|---|---|---|---|
| **LP FE OLS** | | $R^2 = 0.294$ | SE = 0.046 | Vars: 10 | Obs: 60 | $R^2_{adj} = 0.150$ |
| | **Coeff.** | **SE** | ***t*-statistic** | ***p*-value** | **Lower 95%** | **Upper 95%** |
| Intercept | -0.045 | 0.022 | -2.056 | 0.045* | -0.090 | -0.001 |
| $i_t$ | -0.095 | 0.035 | -2.697 | 0.010* | -0.165 | -0.024 |
| $i_{t-1}$ | 0.021 | 0.040 | 0.517 | 0.608 | -0.059 | 0.100 |
| $i_{t-2}$ | -0.116 | 0.043 | -2.704 | 0.009* | -0.202 | -0.030 |
| *Mt* | -0.111 | 0.071 | -1.564 | 0.124 | -0.254 | 0.032 |
| *Mt-1* | 0.166 | 0.091 | 1.827 | 0.074 | -0.017 | 0.348 |
| *Mt-2* | 0.075 | 0.094 | 0.797 | 0.429 | -0.114 | 0.265 |
| *TTO* | 0.018 | 0.020 | 0.910 | 0.367 | -0.022 | 0.058 |
| *MUS* | 0.017 | 0.019 | 0.882 | 0.382 | -0.022 | 0.056 |
| *LUC* | 0.011 | 0.023 | 0.473 | 0.638 | -0.035 | 0.057 |
| *SUR* | 0.016 | 0.025 | 0.655 | 0.516 | -0.034 | 0.067 |
| **ANOVA** | | **df** | **SS** | **MS** | **F** | **Sig. F** |
| | **Reg.** | 10 | 0.044 | 0.004 | 2.043 | 0.049 |
| | **Res.** | 49 | 0.106 | 0.002 | | |
| | **Total** | 59 | 0.150 | | | |

(Source: Calculated by JPC)

| **Table 9: Results for total factor productivity FE OLS model** | | | | | | |
|---|---|---|---|---|---|---|
| **LP FE OLS** | | $R^2$ = 0.294 | SE = 0.046 | Vars: 10 | Obs: 60 | $R^2_{adj}$ = 0.150 |
| | **Coeff.** | **SE** | ***t*-statistic** | ***p*-value** | **Lower 95%** | **Upper 95%** |
| Intercept | -0.040 | 2.399 | -0.017 | 0.987 | -4.963 | 4.883 |
| $i_t$ | 1.816 | 3.009 | 0.604 | 0.551 | -4.357 | 7.990 |
| $i_{t-1}$ | 3.358 | 3.397 | 0.988 | 0.332 | -3.613 | 10.328 |
| $i_{t-2}$ | 0.697 | 3.710 | 0.188 | 0.852 | -6.915 | 8.309 |
| *Mt* | -11.052 | 13.284 | -0.832 | 0.413 | -38.309 | 16.206 |
| *Mt-1* | -6.297 | 13.974 | -0.451 | 0.656 | -34.969 | 22.375 |
| *Mt-2* | 7.042 | 12.824 | 0.549 | 0.587 | -19.271 | 33.356 |
| *TTO* | 0.174 | 1.712 | 0.101 | 0.920 | -3.339 | 3.686 |
| *MUS* | -2.265 | 1.544 | -1.467 | 0.154 | -5.434 | 0.903 |
| **ANOVA** | | **df** | **SS** | **MS** | **F** | **Sig. F** |
| | **Reg.** | 8 | 77.646 | 9.706 | 0.720 | 0.672 |
| | **Res.** | 27 | 363.773 | 13.473 | | |
| | **Total** | 35 | 441.419 | | | |

(Source: Calculated by JPC)