**Capital account flows, consumption ratios and the middle-income trap**

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***Abstract***

Using a sample of 31 OECD countries and 17 middle-income countries over the period 1950-2013, we carry out an empirical investigation of the relationship amongst domestic consumption, capital account flows and the growth rate of GDP. The main findings are that there is an inverted U-shaped relationship between the consumption ratio and economic growth, while capital outflow is positively associated with economic growth but capital inflow is associated with slower growth. These results hold in the full sample of countries, in the high-income group, the middle-income group and in a group that we define as middle-income trapped. An extreme bounds analysis indicates that the results are, for the most part, robust to the inclusion of a range of variables that have been found to be associated with growth in the literature.

**JEL Codes**: O47, E21, F21

**Key Words**: middle-income trap, growth slow-down, consumption ratio, capital account flows

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1. **Introduction**

Having attained middle-income status, a developing country faces the problem of transition to high-income. It may become trapped at the middle-income stage, squeezed between low-income low-wage and high-income high-wage economies, finding it difficult to compete with the former in manufactured exports and the latter in innovative products and services.

The middle-income trap may be exacerbated by both internal and external factors. On the domestic side of the economy, it is necessary to move from a relatively low consumption share of income to a relatively high consumption ratio. If the consumption ratio that is optimal for economic growth cannot be attained, then growth will inevitably be slow. The main challenge faced with respect to the foreign sector is the role of foreign investment, particularly in the context of liberalization of the capital account. Relaxation of controls on foreign investment, both inward and outward, raises the prospect of a foreign exchange or more general financial crisis. It is unclear whether foreign investment inflows and/or outflows are positively or negatively associated with economic growth.

We undertake an analysis of growth slowdowns in a sample of 48 countries over the period 1950 to 2013. We first define and identify periods of slowdown, as well as classifying countries as high-income, middle-income and middle-income-trapped. Then we estimate a panel model of economic growth, focussing on the roles of consumption and the foreign sector, in the full sample and in the sub-samples of high-income, middle-income and middle-income-trapped economies. The main findings are that middle-income trapped economies have consumption ratios that are quite low compared to the ratios that would be optimal for economic growth and that inward foreign investment is associated with lower growth while outward foreign investment is associated with higher economic growth. These two factors pose potentially serious obstacles to escaping the middle-income trap. To examine the robustness of the findings, we conduct an extreme-bounds analysis (EBA), adding to the variables of interest a number of other variables that have been proposed in the literature. The findings are robust to the inclusion of these other factors.

The outline of the paper is as follows. Section 2 presents a selective review of the literature on the middle-income trap, focussing on the role of domestic consumption and the capital account. Section 3 discusses the data and sets out precise definitions of growth slowdowns and classifications of middle-income and middle-income trapped economies. Section 4 outlines the model and the EBA method. The results of the estimations are presented in Section 5 and Section 6 concludes.

1. **Literature review**

In the neo-classical model of economic growth (Solow 1956) the long-run determinants of growth are the growth of the labour force and technological progress. In the process of convergence to long-run equilibrium, the accumulation of capital per worker is the driving force. The further a country is from the long-run value of capital per worker, the faster it will grow so that low-income countries are expected to grow more quickly than middle-income countries. There is nothing in neo-classical theory to suggest that a middle-income country would become trapped at this stage and not achieve high income. However, there are concerns that, in practice, a number of economies have been observed to stall at the middle-income level. The example of a number of Latin American economies (Gill, Kharas and Bhattasali 2007) has been sufficient to raise doubts about if and how some of the emerging Asian economies, including China, will be able to manage the transition from middle to high income (Cai 2012 and Huang 2016).

The term middle-income trap was coined by Gill, Kharas and Bhattasali (2007) and, since then, there have been numerous empirical studies addressing this issue. The theory behind the middle-income trap, however, goes back much further. In the development economics literature of the mid-twentieth century, it was suggested that the principal driver of economic growth was the shifting of labour from the agricultural to the industrial sector (Lewis 1954). In very low-income countries there is a good deal of underemployment in the traditional subsistence agricultural sector. The transfer of surplus labour to the modern sector of the economy, which has much higher productivity, can raise an economy to middle-income status. The experience of China, as workers have migrated from rural areas to the cities, since the adoption of economic reforms under Deng Xiaoping, is the most striking recent example of this process.

Rostow (1960) proposed five stages through which a less-developed economy passes on the way from low-income to high-income. The first stage encompasses a range of traditional agriculture-based societies. In the second stage, an economy attains the pre-conditions necessary for the take-off of growth. In modern times, in less developed countries, this second stage has been marked by contact with foreign influences. In the third stage, a dual economy emerges with some regions of a country being centres of industrialization driven by foreign direct investment while others retain their traditional agricultural basis. Sustained economic growth, requiring high levels of saving and investment, allows a breakthrough to the fourth stage where a country takes its place in the international economy before finally attaining maturity in the high-income fifth stage. Focussing specifically on the case of Vietnam, Ohno (2009) has more recently proposed a similar model of five stages (labelled 0 to 4) with a glass ceiling or middle-income trap between stages 3 and 4. Ohno placed Vietnam, in 2009, at stage one, engaging in simple manufacturing under foreign guidance while Thailand and Malaysia had reached stage two, having absorbed much more foreign technology. Korea and Taiwan have already escaped the middle income trap by mastering advanced technology and management techniques. Japan, the EU and the USA are exemplars of stage four (maturity) as global leaders in design and innovation.

The theory outlined above permits identification of two main hypotheses of interest. First, as a nation moves through these stages, there is a definite pattern in terms of consumption and saving. In traditional agricultural societies, although there may be surplus production, it is insufficient to lead to a high proportion of saving. The accumulation of capital necessary in moving through the next two stages requires that the ratio of saving to output increase, but the breakthrough to maturity will see a fall in saving and an increase in consumption. We postulate that there is an optimal consumption ratio necessary to break out of the potential middle-income trap. Second, the development process relies, at first, on inflows of foreign capital but, escaping the middle income trap and reaching maturity, requires that this flow be reversed. Throughout the process, the liberalisation of the flow of capital may expose a country to the prospect of financial crisis.

China provides an excellent example of the policy changes needed to ensure a successful transition to maturity. The 13th Five-Year Plan of the Chinese Government (2016-2020) recognises that growth needs to be re-balanced away from investment and exports and towards consumption (OECD 2016). There has already been a considerable increase in outward investment with acquisition activity of Chinese companies spurred by China’s *Going Out* Policy (Wang 2016) attracting considerable attention in both the EU and the USA.

The empirical literature on the middle-income trap is subject to a number of practical difficulties. The first of these relates to the economic growth literature in general and has to do with the problem that there is no generally agreed upon model to guide the choice of variables. More specific to the middle-income trap is the lack of a precise definition of what constitutes a trap. For example, how long does a country have to slow down in its growth before it is trapped? Also, is a breakthrough to high income to be measured absolutely or relative to the leading economy? These difficulties explain the lack of consensus in results.

Glawe and Wagner (2016) provide a comprehensive and up-to-date review of the middle-income trap literature focussing on the sizeable number of different definitions and approaches that have been taken as well as also outlining the theoretical foundations of the various approaches. Here we take a more selective approach, choosing those papers that serve to help explain why we take the approach that we do.

Aiyar et al. (2013) use probit regressions to estimate separately the impact of various determinants on the probability of experiencing a slowdown. Their definition of a slowdown is based on first regressing five-year growth rates in a panel of 138 counties over 11 periods (from 1955 to 2009) on only the lagged level of income and measures of physical and human capital. They then consider the residuals from this regression (actual versus estimated values) and define a country as having a sustained slowdown if it is placed in the bottom quintile of deterioration in expected performance. Finally, they use a number of different proxies to capture the effects of institutions, demography, infrastructure, macroeconomic factors, as well as the output and trade structure of economies. They find that growth slowdowns are more likely to occur in middle-income countries than in low-income or high-income countries.

Aiyar et al. (2013) regard their method of identifying slowdowns as superior to what they call the rules of thumb used by some other researchers, for example, Eichengreen, Park, and Shin (2012). However, it is hard to see past the possibility that their initial parsimonious growth model suffers from omitted variables bias so that it could be regarded as rule of thumb, as could their arbitrary classification of the bottom quintile as constituting slowdowns.

Im and Rosenblatt (2015) very explicitly acknowledge that the concept of a middle-income trap is hard to define, drawing the distinction between using a *relative* or catch-up definition to define a slowdown and using stagnation in *absolute* income levels. They employ the useful analogy of studying poverty by either a relative or an absolute measure. The relative approach, seemingly based on the catch-up theory as in the standard neo-classical growth model, as espoused by Aiyar et al. (2013), requires a poor country to grow faster than the rich leader country to ever catch up. Given even an assumed very modest growth rate of the leader, Im and Rosenblatt (2015) point out the unpleasant arithmetic facing poor countries: either they need to grow consistently at rates over 8% (very high in historical experience) or take many generations to achieve catch-up. Use of an absolute threshold in income level at least permits eventual catch up, even if high growth rates are still required to do so in a time-frame of interest to present generations.

Im and Rosenblatt’s own empirical method is to use a transition matrix approach. Having classified countries into a number of income groups, they consider the 10-year transition probabilities from one group to another. According to this method, they find little evidence of the existence of a middle-income trap at all. Their reasoning is that they find it just as likely that an upper-middle income country transitions to high-income as a lower-middle income country transitions to upper-middle income. Even accepting this finding, it could be regarded as merely semantic to insist on not using the term trap when convergence is very slow. Indeed, Gill and Kharas (2015: 4), as originators and perhaps unwitting popularisers of the term (Gill, Kharas and Bhattasali 2007), suggest that their use of these words was more about suggesting, “a trap of ignorance about the nature of economic growth in middle-income countries” and “not a statement that middle-income countries are more likely to be trapped than other countries.”

Gill and colleagues originally were drawing attention to the fact that, from 1950 to the mid-1970s, a group of Latin American economies (Argentina, Brazil, Chile, Colombia and Mexico) had grown rapidly before abruptly stagnating and failing to breakthrough to high-income status. Their concern was particularly for a then fast-developing group of East Asian countries (Indonesia, Malaysia, the Philippines, Thailand and Vietnam) and how they might avoid similar stagnation. Endogenous growth theories seem to relate best to low-income countries with the standard neo-classical model addressing high-income countries, leaving middle-income nations with no satisfactory theoretical guides to policy. Gill and Kharas (2015) see the key transitions that have to be managed as a shift from reliance on capital accumulation (with a relatively low consumption ratio) to higher levels of consumption and a shift from reliance on foreign direct investment (FDI) to an increase in outward investment.

The approach that we use here to identify episodes of slowdown is closest to that of Eichengreen, Park and Shin (2014), in turn built on that in Eichengreen, Park and Shin (2012) and Hausmann, Pritchett and Rodrik (2005). They define a country as having suffered a slowdown if its seven-year average growth rate of income *per capita* had been strong, at over 3.5%, and it fell by at least two percentage points. They exclude low-income countries by requiring GDP *per capita* in 2005 constant international PPP prices of over $10,000. They run probit regressions with the occurrence of a slowdown as the dependent variable, finding that there are two levels of income around which slowdowns cluster: at $10,000 to $11,000 and at $15,000 to $16,000 2005 PPP dollars. This is adduced as evidence in favour of the existence of a middle-income trap.

Our focus is not on adding to the discussion of the existence or non-existence of a middle-income trap but rather, accepting that the term may have been used in an imprecise manner, examining our two main hypotheses with respect to what might cause middle-income countries to stagnate in absolute terms and therefore potentially to languish far behind the leader country for many decades. We also pay close attention to the robustness of our findings.

1. **Analysis of slowdown**

The Penn World Tables (PWT) Version 8.0 (Feenstra, Inklaar and Timmer 2013) provide data on *per capita* incomes over the period 1950-2013 for 31 OECD countries as well the following 17 major developing countries: Argentina, Bangladesh, Brazil, China, Egypt, Nigeria, India, Indonesia, the Pakistan, Malaysia, the Philippines, Russia, Singapore, South Africa, Thailand, Venezuela and Vietnam. Other data necessary for our analysis is sourced from the official websites of the IMF, the OECD and the World Bank (World Bank Indicators Data).

To identify an episode of slowdown in economic growth for any of these countries, we impose the following two conditions:

1. The seven-year average growth rate of *per capita* GDP is greater than 3.5% prior to the slowdown.
2. The decline in growth rate is by at least two percentage points.

These conditions for a slowdown are the same as in Eichengreen, Park and Shin (2014) and are met by every country in our data set with the exception of the USA, confirming that economic slowdown is practically a universal phenomenon and is certainly not restricted to middle-income countries. The details of periods identified as slowdowns are available from the authors on request.

In addition to conditions (1) and (2), we impose the following two conditions to define those countries potentially facing the middle-income trap:

1. GDP *per capita* is between USD 3000 and USD 20 000 in 2005 constant PPP. This condition is imposed in order to exclude very poor and very rich countries.
2. During the slowdown, the growth rate of GDP *per capita* did not remain above 2%. This final condition excludes middle-income countries which, while having experienced a slowdown, nevertheless continued to experience quite strong growth.

On the basis of the above conditions, we define the following sub-samples of countries to be used in subsequent analysis: All countries in the full sample of 48, the 31 high-income OECD countries named above, the 17 middle-income countries named above and the middle-income trapped countries (the 14 middle-income countries that meet *all four* of the conditions above). The fourteen countries satisfying all four conditions are: Argentina, Brazil, Chile, Egypt, Hungary, Indonesia, Malaysia, Mexico, Nigeria, the Philippines, South Africa, Thailand, Turkey and Venezuela. The three middle-income countries not satisfying condition (4) are China, Poland and Russia.

1. **The model and econometric methods**

There is little consensus as to what model should be used in cross-country growth regressions with empirical work abounding in regressions that are, at best, guided by the theoretical literature. Given this problem, we start with a simple model centering on explaining the growth of output in terms of the evolution of its main components: investment, consumption, government spending and flows of foreign funds. Specifically, the equation to be estimated is:

$$YG\_{it}=a\_{0}+a\_{1}INV\_{it}+a\_{2}CON\_{it}+a\_{3}GOV\_{it}+a\_{4}FORIN\_{it}+a\_{5}FOROUT\_{it}+u\_{i}+e\_{it}$$

*i* indexes the countries in the sample and *t* is time. *YG* is the growth rate of GDP, *INV*, *CON* and *GOV* are the shares in GDP of investment, consumption and government expenditure, respectively. *FORIN* is inward flows of foreign investment and *FOROUT* is outward flows of investment.

To this basic specification we will add the square of the consumption term to try to establish if there is an optimal consumption ratio.

Once we can establish that the variables of interest in this equation are significant, we can address robustness by adding a range of other variables suggested in the literature to see if their addition affects the findings. Leamer (1985) outlines the method known as extreme-bounds analysis (EBA). In essence, it involves adding a subset of variables chosen from a pool of variables identified by past studies as potentially important explanatory variables of growth. By altering the set of variables included in the regression, we find the possible range of coefficient estimates on the variables of interest that standard hypothesis tests do not reject. That is, we first run the basic regression to find the coefficient *ai* of a variable of interest and then we add variables to the model and run an extending regression and identify the highest and lowest values for the coefficient of the variable of interest that cannot be rejected at the 5% significance level. The highest coefficient is denoted as *aimax*  and the lowest as *aimin.* The top extreme high bound is $\overbar{a\_{i}}=a\_{i}^{max}+2δ\_{i}^{max}$where $δ\_{i}^{max}$ is the standard deviation of $a\_{i}^{max}$. Similarly, the extreme low bound is $\overline{a\_{i}}=a\_{i}^{min}+2δ\_{i}^{min}$where $δ\_{i}^{min}$ is the standard deviation of $a\_{i}^{min}$. If *ai* remains significant and of the same sign at the extreme bounds, then we refer to the result as *robust* and, if not, we call it *fragile.*

By introducing more values into the EBA model, the potential for multicollinearity increases; the standard errors on the coefficients tend to increase and the range of values of the coefficient of interest widens. EBA has, therefore, been criticized as being so stringent a test that it is unlikely to find variables that are robust. In a much-cited paper, Levine and Renelt (1992) used the EBA method to study the determinants of economic growth and found almost all variables to be fragile. Sala-i-Martin (1997) suggested a less restrictive version of EBA and, of course, found many more robust correlates of economic growth. Of course, Multicollinearity does not give rise to bias in the estimated coefficients but is inefficient, leading to an inability to identify a statistical relationship sensitive to the conditioning set of information. Therefore, Levine and Renelt (1992) restricted the EBA model in three ways. First, when adding variables to an extending regression, they only allowed the procedure to choose up to three extra variables from the pool of variables identified as potentially important for explaining cross-country growth differentials, and restricted the total number of explanatory variables included in any one regression to be eight or fewer. The second way was to choose a small pool of variables from which to select extra variables. Third, they further restricted the pool of variables from which they chose extra variables by excluding variables that, *a priori*, might measure the same phenomenon.

Our EBA variables are chosen based on the vast empirical growth literature and on the availability of data. Table 1 contains a list of the variables and their definitions, including those in the basic equation (1). The extra variables used in all possible groups of three in the EBA are: *CPI*, the index of consumer prices, *DFCT*, the government’s primary budget deficit, *EXP*, the share of exports in GDP, *NEX*, the ratio of exports minus imports to GDP, *M2*, the ratio of M2 (a measure of the supply of money) to GDP, *LG,* the growth rate of the population, *SEC*, the secondary school enrolment rate, *SAV*, the private sector saving rate (savings as a proportion of GDP), *RD*, the share of GDP spent on research and development and *LRI*, the lending rate of interest.Interaction terms between domestic investment and foreign capital flows (both inward and outward, i.e., *INV\*FORIN and INV\*FOROUT*)are also included to check whether the capital account has an indirect influence on economic growth through improving the efficiency of capital allocation efficiency.

*TABLE 1 ABOUT HERE*

Note that all of the variables are in the form of growth rates or ratios and, as such, they are unlikely to be non-stationary.

1. **Results**

Table 2 shows the results of estimating equation (1) in the full sample of countries and in each sub-sample using a fixed effects panel model. A random effects model was also estimated but the Hausman test indicated that fixed effects was the appropriate model.

*TABLE 2 ABOUT HERE*

As might be expected, the coefficient of the investment variable is positive and statistically significant in all four samples, with the effect stronger in middle-income than in high-income countries, consistent with diminishing returns to capital. However, in the middle-income sample and middle-income trapped sample, the coefficient on consumption is not statistically significant. In the high-income and full samples it is actually statistically significant and negative. Therefore, in spite of the coefficient on all other variables being significant, with the sole exception of outward foreign investment flows in the high-income sample, and the overall fit of the models being reasonable, the performance of the consumption ratio casts doubt on the specification.

Table 3 shows the results from estimating equation (1) with the addition of the square of the consumption ratio, consistent with the hypothesis that there is an optimal consumption ratio with respect to economic growth.

*TABLE 3 ABOUT HERE*

In this specification, the coefficient of the consumption ratio is positive and statistically significant in every sample. Moreover, the coefficient on the squared term in consumption is statistically significant and negative in every sample. The implied quadratic relationship between the consumption ratio and growth indicates that growth is slow at low consumption ratios, rises to a peak as the consumption ratio rises and then falls again as the consumption ratio continues to rise. That is, there is an optimal consumption ratio with respect to maximising growth prospects. These optimal consumption ratios are shown in the last row of Table 3. The optimal consumption ratio in middle-income countries is much higher than that in high-income countries, confirming that a shift from relatively low consumption to relatively high consumption is necessary in making the transition from middle to high-income status.

The capital account flow variables show a very consistent pattern across all of the samples. Inward foreign investment has a negative effect on economic growth in all cases with the effect stronger in the middle-income countries than the high-income countries by an order of magnitude. By contrast, outward foreign investment flows are positive for economic growth and, again, the effect in the middle-income countries is stronger by an order of magnitude over the effect in the richer countries.

Table 4 shows the results of performing an EBA on the coefficients of the consumption variable and its square as well as inward and outward flows of foreign investment. Groups of three extra variables at a time are added in order to examine the robustness of the results in Table 3. In Table 4, for each of the variables of interest (*CON, CON2*, *FORIN*, *FOROUT*), the highest and lowest estimated coefficients are reported, followed by the extreme bounds interval. The set of three variables giving rise to the highest and lowest estimated is also noted. Finally, in the last column of Table 4 it is stated whether the result is robust or fragile.

 *TABLE 4 ABOUT HERE*

It turns out that all of the findings are robust with the exception of the coefficient on the outflow of foreign funds in the case of the high-income sample; this is the only case of the extreme bounds interval containing zero. The coefficient on *FOROUT* for the high-income countries in Table 3 was statistically insignificant so that, naturally, this coefficient had to be fragile. As discussed above, the EBA method is rather stringent, yet it has found that the rest of the findings in Table 3 are robust to the introduction of a wide range of other conditioning factors.

1. **Conclusion**

The EBA gives us considerable confidence in affirming the two hypotheses of interest: that there is an optimal consumption ratio and that foreign investment flows matter.

First, the relationship between consumption and economic growth follows an inverted-U shape. There is an optimal consumption ratio and it is notably higher in the middle-income countries than in the high income countries, at around 67%, as opposed to 50%. In the middle-income trapped countries it is around 63%. A faster transition from middle to high-income can be attained by increasing consumption to the optimal ratio but some slowdown is inevitable as a higher income level is reached.

Second, in the middle-income countries, outflows of foreign investment are positively associated with growth while inflows are negatively associated with growth. The breakthrough to high income status therefore entails not restricting the outward flow of investment funds.

**Table 1 –Variable definitions**

|  |  |
| --- | --- |
| *Variable* | Definition |
| *YG* | Growth rate of GDP |
| *INV* | Investment share of GDP |
| *CON* | Consumption share of GDP |
| *GOV* | Government spending share of GDP |
| *FORIN* | Ratio of foreign liabilities to GDP |
| *FOROUT* | Ratio of foreign assets to GDP |
| *CPI* | Consumption price index |
| *DFCT* | Ratio of government deficit to GDP |
| *EXP* | Export share of GDP |
| *NEX* | Net export share of GDP |
| *M2* | Ratio of M2 to GDP |
| *LG* | Annual rate of population growth |
| *SEC* | Secondary-school enrollment rate |
| *SAV* | Savings share of GDP |
| *RD* | Ratio of R&D investment to GDP |
| *LRI* | Lending interest rate |

**Table 2 – Basic growth regression: Equation (1)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Full sample | High Income | Middle Income | Middle Income Trapped |
| *Constant* | 14.1601\*\*\*(0.0000) | 20.6408\*\*\*(0.0000) | 4.4364\*(0.0824) | 1.8729(0.5587) |
| *INV* | 0.0940\*\*\*(0.0004) | 0.0693\*(0.0918) | 0.1319\*\*\*(0.0002) | 0.1679\*\*\*(0.0000) |
| *CON* | -0.0719\*\*\*(0.0017) | -0.1273\*\*\*(0.0034) | 0.0361(0.1738) | 0.0471(0.1725) |
| *GOV* | -0.4901\*\*\*(0.0000) | -0.6128\*\*\*(0.0000) | -0.3546\*\*\*(0.0000) | -0.2773\*\*\*(0.0003) |
| *FORIN* | -0.0096\*\*\*(0.0001) | -0.0054\*\*(0.0235) | -0.0451\*\*\*(0.0000) | -0.0414\*\*\*(0.0001) |
| *FOROUT* | 0.0081\*\*(0.0244) | 0.0038(0.2662) | 0.0546\*\*\*(0.0003) | 0.0447\*\*\*(0.0083) |
| *R2* | 0.5297 | 0.3309 | 0.4773 | 0.3535 |
| *F* | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| *DW* | 1.5144 | 1.4651 | 1.6549 | 1.7396 |

Notes: Dependent variable: YG; p-values are in parentheses; \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

**Table 3 – Equation (1) with square of consumption variable**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Full sample | High Income | Middle Income | Middle Income Trapped |
| *Constant* | -0.1881 (0.9608) | -9.6871(0.2141) | -8.0692(0.0912) | -22.0545(0.0173) |
| *INV* | 0.0859\*\*\*(0.0018) | 0.0435(0.3047) | 0.1378\*\*\*(0.0001) | 0.1649\*\*(0.0000) |
| *CON* | 0.4349\*\*\*(0.0000) | 1.0058\*\*\*(0.0000) | 0.4528\*\*\*(0.0022) | 0.8669\*\*\*(0.0018) |
| *CON2* | -0.0043\*\*\*(0.0000) | -0.0101\*\*\*(0.0000) | -0.0034\*\*\*(0.0042) | -0.0069\*\*\*(0.0002) |
| *GOV* | -0.5092\*\*\*(0.0000) | -0.6489\*\*\*(0.0000) | -0.3608\*\*\*(0.0000) | -0.2863\*\*\*(0.0002) |
| *FORIN* | -0.0096\*\*\*(0.0002) | -0.0060\*\*(0.0146) | -0.0450\*\*\*(0.0000) | -0.0429\*\*\*(0.0001) |
| *FOROUT* | 0.0085\*\* (0.0218) | 0.0063(0.1597) | 0.0556\*\*\*(0.0005) | 0.0472\*\*\*(0.0077) |
| *R2* | 0.4953 | 0.3526 | 0.4850 | 0.3697 |
| *F* | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| *DW* | 1.5301 | 1.4778 | 1.6866 | 1.7948 |
| *Optimal CON*  | 50.57 | 49.80 | 66.59 | 62.82 |

Notes: Dependent variable: YG; p-values are in parentheses; \* p<0.1, \*\* p<0.05, \*\*\* p<0.01

**Table 4 Extreme Bounds Analysis of consumption and foreign account variables**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Variable* | *ai* | *Standard error* | $a\_{i}\in [ \overline{a\_{i}},\overline{a\_{i}}$ ] | *t* | *Other variables* | *Robust**/**Fragile* |
|  |
| **Full sample** | *CON* | High:0.5413Low:0.4562 | 0.10760.1439 | *ai* =0.4349[0.1684,0.7565] | 0.00000.0016 | *{NEX,LRI,FORIN\*INV}**{NEX,CPI,LG}* | Robust\*\*\* |
| *CON2* | High:-0.0046Low:-0.0053 | 0.00110.0009 | *ai* =-0.0043[-0.0071,-0.0035] | 0.00000.0000 | *{NEX,CPI,LG}**{NEX,LRI,FORIN\*INV}* | Robust\*\*\* |
| *FORIN* | High:-0.0101Low:-0.0128 | 0.00260.0029 | *ai* =-0.0096[-0.0186,-0.0049] | 0.00010.0000 | *{NEX,CPI,LG}**{NEX,LRI,FORIN\*INV}* | Robust\*\*\* |
| *FOROUT* | High:0.0116Low:0.0090 | 0.00370.0038 | *ai* =0.0085[0.0014,0.0190] | 0.00160.0168 | *{NEX,LRI,FORIN\*INV}**{NEX,CPI,LG}* | Robust\*\* |
|  |
| **High income** | *CON* | High:0.8659Low:0.7434 | 0.30280.2797 | *ai* =1.0058[0.1840,1.4715] | 0.00440.0080 | *{NEX,LRI,FORIN\*INV}**{NEX,CPI,**FOROUT\*INV}* | Robust\*\*\* |
| *CON2* | High:-0.0090Low:-0.0096 | 0.00230.0024 | *ai* =-0.0101[-0.0144,-0.0044] | 0.00010.0001 | *{NEX,CPI,**FOROUT\*INV}**{NEX,LRI,FORIN\*INV}* | Robust\*\*\* |
| *FORIN* | High:-0.0069Low:-0.0095 | 0.00270.0024 | *ai* =-0.0068[-0.0143,-0.0015] | 0.01110.0001 | *{NEX,CPI,**FOROUT\*INV}**{NEX,LRI,FORIN\*INV}* | Robust\*\* |
| *FOROUT* | High:0.0090Low:0.0058 | 0.00350.0044 | *ai* =0.0063[-0.0030,0.0160] | 0.01050.1894 | *{NEX,LRI,FORIN\*INV}**{NEX,CPI,**FOROUT\*INV}* | Fragile |
|  |
|  | *Variable* | *ai* | *Standard error* | $a\_{i}\in [ \overline{a\_{i}},\overline{a\_{i}}$ ] | *t* | *Other variables* | *Robust**/Fragile* |
| **Middle income** | *CON* | High:0.4531Low:0.4114 | 0.11030.1136 | *ai* =0.4528[0.1842,0.6737] | 0.00010.0003 | *{NEX,CPI,FORIN\*INV}**{NEX,SEC,LRI}* | Robust\*\*\* |
| *CON2* | High:-0.0033Low:-0.0036 | 0.00100.0009 | *ai* =-0.0034[-0.0054,-0.0013] | 0.00070.0001 | *{NEX,SEC,LRI}**{NEX,CPI,FORIN\*INV}* | Robust\*\*\* |
| *FORIN* | High:-0.0476Low: -0.0768 | 0.01230.0353 | *ai* =-0.0450[-0.1474,-0.0230] | 0.00010.0301 | *{NEX,SEC,LRI}**{NEX,CPI,FORIN\*INV}* | Robust\*\* |
| *FOROUT* | High:0.0680Low:0.0656 | 0.01810.0188 | *ai* =0.0556[0.0280,0.1042] | 0.00020.0006 | *{NEX,CPI,FORIN\*INV}**{NEX,SEC,LRI}* | Robust\*\*\* |
| **Middle income trapped** | *CON* | High:0.7096Low:0.6821 | 0.29670.3091 | *ai* =0.8669[0.0639,1.3030] | 0.01750.0282 | *{NEX,LG,CPI}**{NEX,CPI,**FOROUT\*INV}* | Robust\*\* |
| *CON2* | High:-0.0054Low:-0.0058 | 0.00250.0024 | *ai* =-0.0069[-0.0106,-0.0004] | 0.03050.0156 | *{NEX,CPI,**FOROUT\*INV}**{NEX,LG,CPI}* | Robust\*\* |
| *FORIN* | High:-0.0335Low:-0.0439 | 0.01350.0090 | *ai* =-0.0429[-0.0619,-0.0065] | 0.01380.0000 | *{NEX,LG,CPI}**{NEX,CPI,**FOROUT\*INV}* | Robust\*\* |
| *FOROUT* | High:0.0475Low:0.0339 | 0.02690.0199 | *ai* =0.0472[-0.0059,0.1013] | 0.07870.0891 | *{NEX,CPI,**FOROUT\*INV}**{NEX,LG,CPI}* | Robust\*  |

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