Catching Up by 'Deglobalizing': Capital Account Policy and Economic Growth

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While substantial empirical research has evaluated the question of whether capital account openness promotes economic growth, this paper finds empirical evidence for cases where the opposite is true—that a policy of capital controls can promote economic growth, when combined with a policy of reserve accumulation. Using panel data from 45 countries from 1985–2014, we find that capital controls combined with reserve accumulation—strategic capital account policy—contribute to growth in real GDP and TFP. We show that the policy is strongly associated with enlarging the scale of the manufacturing sector and productivity, and is consistent with theories of learning by doing through exporting.

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1 Introduction

Financial liberalization has been a prominent development in the global economy and a central topic of study in international economics. Theory suggests that financial openness could promote growth in emerging markets by reducing financial constraints and facilitating the accumulation of capital. A large empirical literature has tested this proposition, with mixed success. This paper provides empirical evidence for a scenario where the opposite policy—pursuing a policy of financial deglobalization—appears to succeed in promoting economic growth in emerging markets. This scenario involves capital controls that are combined with reserve accumulation. Substantial reserve accumulation among some emerging markets is another prominent development of recent decades, and it is not by coincidence that some of these countries have had particular success in promoting economic growth.[1] China is an obvious, but not isolated example.

Recent theory has posited a number of reasons why financial openness could be harmful while capital controls could be welfare improving. For example, capital controls may prevent excessive borrowing.[2] Michaud and Rothert (2014) present a model where borrowing constraints on households promote growth by increasing labor supply. A number of theories are based on the idea that capital controls can support currency undervaluation and trade surplus, which may favor development of the manufacturing sector, and thereby address a learning by doing externality specific to that sector. Some examples include Aizenman and Lee (2010), Korinek and Servén (2016), and Choi and Taylor (2022).[3] Our work can be viewed as presenting empirical evidence to support this linkage between capital market restrictions and economic growth through sectoral

[1] While the average international reserves were around 5-10% of GDP in the early 1990s, emerging economies have accumulated reserves of more than 20-40% of GDP by the late 2000s. See Obstfeld, Shambaugh, and Taylor (2010) for further details.

[2] See for example Schmitt-Grohe and Uribe (2016) and Farhi and Werning (2016).

[3] See Dooley, Folkerts-Landau, and Garber (2004), Gúlzmann, Levy-Yeyati, and Sturzenegger (2012) for the early debate. Rodrik (2008) presents a model of learning by doing initiated by real exchange rate undervaluation, but this is not linked in a model to an explicit capital account policy. In addition, Aizenman and Lee (2007) compare the mercantilist and the precautionary motives, and concluded that the precautionary motive view was more supported. Lee and Luk (2018) introduce a precautionary motive generated by "model uncertainty" to understand a surge in the reserves after the Asian Financial Crisis. Obstfeld, Shambaugh, and Taylor (2010) consider reserves as a key tool for managing domestic financial instability. Jung and Pyun (2016) focus on the liquidity role of the reserves in attracting venture capital because decentralized trade with U.S. treasury bonds works as a facilitator for reserve accumulation. Bussière, Cheng, Chinn, and Lisack (2015) and Aizenman, Cheng, and Ito (2015) document the trend and nature of reserve accumulation after the crisis. Jeanne and Rancière (2011) construct a model of optimal reserves and document that the level of reserves in Asian countries after the financial crisis are notably high. We note that Asian countries, including China, Korea, etc., have not only had high reserves, but also relatively severe capital account restrictions, even compared to others in the similar income group.

reallocation favoring the manufacturing goods sector.

In particular, using panel data from 45 countries during the period of 1985 to 2007 (expanded to 2014 in our robustness check), we first confirm that capital controls combined with reserve accumulation are positively associated with real GDP growth. We use a normalized capital control index modified from Chinn and Ito (2008). If an economy that fully restricts its capital account increases reserves relative to GDP by one percentage point, it has a higher real GDP growth by 2.94 percentage points. Further, we explore the channel, by documenting that the combination of reserve accumulation and capital controls leads to an expansion in the manufacturing sector, which acts as a workhorse for economic growth. If reserves accumulation as a ratio to GDP is higher by one percentage point along with full capital account restriction, the labor share allocated to the manufacturing sector will increase by 0.46 percentage points. Expanding labor into the sector naturally maps into a larger production of the sector.

Past empirical work such as in Rodrik (2008) has provided evidence of a linkage between real exchange rate undervaluation and growth through learning by doing. Our contribution is to show evidence linking the growth to capital account policy, which may be viewed as the underlying source of the real exchange rate undervaluation. We argue that there are several benefits to focusing empirical work on capital account policy rather than the exchange rate. First, the exchange rate is an endogenous variable that responds to a wide range of financial market forces. Rodrik (2008) acknowledges this limitation, and appeals to the idea of a capital account policy behind the currency undervaluation he studies, but he does not take the step of measuring this policy directly. Second, measuring currency undervaluation requires estimating the equilibrium exchange rate, which depends upon contestable theoretical assumptions. For example, the measurement of undervaluation in Rodrik (2008) is the product of computation using regressions of the real exchange rate on output, based on the theory of Balassa and Samuelson. Using a direct measure of reserve accumulation sidesteps this tricky inference and computational issue. In the presence of capital controls that preclude offsetting private capital flows, reserve accumulation is directly linked through the balance of payments identity to the current account surplus, which is the conjectured goal of currency undervaluation.

Finally, if the objective of the researcher is to study policies that promote growth, it is likely more fruitful to study the actual government capital and reserves policies, rather than study the behavior of an economic variable like the exchange rate, which is the endogenous and rather noisy

outcome of that policy. In practical terms, when we replicate the specification of Rodrik (2008) for our sample, regressing GDP and productivity on his measure of currency undervaluation, results are substantially weaker in terms of significance and robustness compared to our benchmark results when regressing on a measure of capital account policy.

Our focus on a measure of capital account policy builds on the recent work of Choi and Taylor (2022). Their contribution was to show evidence linking reserve accumulation in the presence of capital controls to exchange rate determination. Our distinct contribution is to show the further linkage to growth through manufacturing productivity levels and shifts in sectoral allocation of labor, as implied by the theories of learning by doing cited above.

We also contribute to the classic question of the relationship between economic growth and financial openness. There has been a vast amount of literature that documents the effect of financial globalization on economic growth, such as Bonfiglioli (2008) and Kose, Prasad, and Terrones (2009). Bonfiglioli (2008) finds that financial integration has a positive effect on productivity growth, but it does not significantly affect capital accumulation. Kose, Prasad, and Terrones (2009) further show that disaggregated financial openness measures (e.g., FDI, equity, and debt) have different effects on TFP.[4] Our work is distinct, in that we ask the opposite question, whether a closed (*de jure*) capital account can have a positive effect on growth when complemented by large reserve holdings. Thus, our contribution proposes a possibility of the non-linearity of capital liberalization on productivity. Although conventional wisdom holds that financial liberalization spurs growth, if combined with reserve accumulation—thus in a mercantilist point of view—financial de-liberalization could also be associated with economic growth.

Our empirical results also provide a potential answer to the *premature deindustrialization puzzle* posed by Rodrik (2016), noting a trend of deindustrialization in recent decades where Asian countries are the exception.[5] We provide evidence that countries with high reserves and capital controls expand the share of the manufacturing sector, which could explain why Asian countries have a relatively larger manufacturing share. From another perspective, our work claims that the

[4] Kose, Prasad, and Terrones (2009) show that higher FDI and portfolio equity liabilities are associated with higher medium-term TFP growth, while external debt is actually negatively correlated with TFP growth. Please see Henry and Sasson (2008), Kose, Pradad, Rogoff, and Wei (2006) and the reference within for the early debate.

[5] He claims that a hump-shaped relationship between the share of employment and the output of the manufacturing sector has shifted downward. Thus, the share of the manufacturing sector will decrease as the level of development evolves. However, the level is shrinking much faster, except in East Asian countries.

long run effect of reserves accumulation works through the reallocation of labor into the manufacturing sector, not through exchange-rate induced expenditure switching. It is widely accepted that reserves accumulation could not enhance productivity through nominal devaluation.[6] Our results support the conclusion that what was widely perceived as an external policy is effective on internal real reallocation.

Finally, our work is related to a well-known allocation puzzle of the negative correlation between growth and capital flows across developing countries. Gourinchas and Jeanne (2013) document that, unlike a neoclassical growth theory, capital does not flow more to countries that invest and grow more. Alfaro, Kalemli-Ozcan, and Volosovych (2014) claim that sovereign to sovereign transactions account for upstream capital flows. Our dynamic panel estimation provides a new perspective on the puzzle by utilizing not only cross sectional, but also time series variations of capital flows and growth.

The rest of the paper is organized as follows. Section 2 details the data set and empirical specifications. Section 3 presents the empirical results regarding the impact of capital account policy on growth in GDP and TFP. Section 4 compares results for an alternative specification in terms of currency undervaluation rather than capital account policy. Section 5 presents empirical results regarding the impact on sectoral allocations. Our concluding remarks appear in Section 6.

2 Empirical Methodology

2.1 Data

The sample includes 45 countries—23 emerging market economies and 22 advanced economies (see the list of countries in Appendix Table A1). The main sample runs for 1985-2007, where we follow Choi and Taylor (2022) in ending the sample before the onset of the Global Financial Crisis.[7] Robustness checks consider a sample extended to 2014.

We collect real GDP, TFP, foreign reserves, terms of trade, and trade openness from standard data sources such as *International Financial Statistics* from the IMF, the *Penn World Table*, and *World Development Indicator* (*WDI*). Private credit is collected from the *Global Financial*

[6] See Jeanne (2013) for further details.

[7] During the Global Financial Crisis, reserves decreased in many countries, and their GDP growth rates also slowed, which could generate a positive correlation of the two variables. However, the correlation is not our focus, so the baseline analysis uses data ending in 2007.

Development Database, World Bank. The quality of institutions is taken from the *International Country Risk Guide*. We use proprietary data, namely investment profile, as a measure of institutional quality, which takes on values from 0 to 12. The human capital index is a percentage of complete tertiary schooling attained in the population that comes from Barro and Lee (2013). A crisis dummy variable contains historical banking, and currency and debt crisis events recorded by Laeven and Valencia (2020). All variables are 5-year averages. Please see Appendix Table A2 for the summary statistics.

For a measure of capital controls, we modify the capital control index of Chinn and Ito (2008). This is constructed using the Annual Report on Exchange Arrangements and Exchange Restrictions from the IMF, as follows,

$$CC = 1 - KAOPEN, \tag{1}$$

where *KAOPEN* is a standardized measure of *de jure* financial openness, which ranges from 0 (closed) to 1 (open). Note that we will interchangeably use the index of capital control (CC) with financial closedness. Previous studies used actual external asset and liability holdings of a country, namely a *de facto* measure of financial globalization, to identify the effect of globalization on economic growth. However, we believe that a *de jure* measure is more appropriate if one is interested in the effect of the policies on growth. Under our framework, reserves combined with capital controls are more fundamental instruments, and these measures shape overall external asset and liability holdings and macroeconomic growth. The *de jure* index captures the legislated degree of capital controls, which will affect the endogenous decision of private external positions along with reserves accumulation. Thus, we believe that the measure is more appropriate for our analysis.

For other variables that represent the channels of capital account policy on growth, we first calculate employment share and real value-added at the sectoral level.[8] Our data for the manufacturing sector come from several different sources, including the World Input Output Database (WIOD), EU KLEMS and WKLEMS, OECD, STAN, and GGDC 10 sector database. We use the manufacturing sector as the tradable goods sector, and all other sectors are attributed to be the non-tradable goods sector. More specifically, manufacturing share of employment and real value for country *i* are added as follows;

[8] We restrict out interest to labor, and we do not incorporate physical capital. Capital stocks at the sectoral level are very difficult to measure and are vulnerable to measurement errors, especially in emerging economies.

$$Labor\ MS_{it} \;=\; L_{it}^{Manufacturing} \;/\; L_{it}^{Total}\,, \tag{2}$$

$$RVA\ MS_{it} \;=\; RVA_{it}^{Manufacturing} \,/\, RVA_{it}^{Total}\;. \tag{3}$$

Then we further divide real value added by employment to construct labor productivity (*LP*) by each industry *s*:

$$LP_{j,t}^{s} = RVA_{it}^{s} \,/\, L^{s}{}_{it}. \tag{4}$$

We construct annual data then take the average of 1985-1990, 1990-1995, 1995-2000, 2000-2005 and 2005-2007. We note incorporating 5-year averaged data is standard in cross-country growth literature. Owing to the global financial crisis, we use only 3 years of information within the last period. We extend the period up to 2014, and thus, 2005-2009 and 2010-2014 observations are added, so we have six periods in our robustness check.

2.2 Empirical Specifications

2.2.1 Economic Growth and Total Factor Productivity

We use a cross-country panel regression, using 5-year averaged data. We analyze within variation to identify the effect of the capital account policy, using the following specification:

$$\Delta(\ln y)_{it} = \beta_0 + \beta_1 ln y_{it-1} + \beta_2 CC_{it} + \beta_3 \Delta RSRV_{it} + \beta_4 (CC_{it} \times \Delta RSRV_{it}) + X'_{it}\gamma + \varphi_i + \rho_t + \varepsilon_{it}, \tag{5}$$

where the subscripts i and t represent specific countries and five-year time periods. $\Delta(\ln y)_{it}$ is the (total) real GDP and (average) TFP growth in period t. $\ln y_{it-1}$ is (log of) the initial level of real GDP or TFP at the beginning of each period. CC_{it} is our measure for capital controls, and we incorporate the full capital control measure and its interaction with reserves. We also note that $\Delta RSRV_{it}$ is a 5-year average of annual differences in reserves as a ratio to GDP in the period t.

We first implement country fixed effect (henceforth FE) estimations to control for heterogeneity because η_i can be correlated with ε_{it}. Accordingly, the FE estimator, in general, is consistent. However, the estimates of $ln y_{it-1}$ may be biased because the initial GDP or productivity variable in period t is correlated with the dependent variable, which causes a "Nickell" bias in the estimation of β_1 (Nickell, 1981). We also introduce the system-GMM estimator (Arellano and

Bover, 1995, Blundell and Bond, 1998).[9] As the validity of the GMM estimator depends on whether the explanatory variables' lagged values are valid instruments, we conduct a weak instrument test (Sanderson, and Windmeijer, 2016), and an over-identification restriction test where failure to reject the null hypothesis gives support for the valid instruments. Lastly, for the specification test, it is necessary to check whether the error term, ε_{it}, is serially correlated; if it is not, then the first order differenced error terms $(\varepsilon_{it} - \varepsilon_{it-1})$ are expected to have a serial correlation, and the second-order differenced error terms $(\varepsilon_{it} - \varepsilon_{it-2})$ have no serial autocorrelation. So, the test results for first and second order autocorrelation in the differenced error terms are also reported.

2.2.2 Sectoral Reallocation

Next, we discuss how the combined reserve and capital controls affect sectoral allocation. Our baseline specification analyzes the effect of exactly the same policy mix on the share of manufacturing employment and real value-added. We have the following specification,

$$MS_{it} = \beta_0 + \beta_1 CC_{it} + \beta_2 \Delta RSRV_{it} + \beta_3 (CC_{it} \times \Delta RSRV_{it}) + H'_{it}\gamma + \eta_i + \rho_t + e_{it}\,, \qquad (6)$$

where MS_{it} refers to the labor and real value-added shares in a manufacturing sector for country i at period t. $\Delta RSRV_{it}$ is a 5-year average of annual differences in reserves as a ratio to GDP in the period t. For the robustness of the results, we slightly modify our reserve variable because we are focusing on the "level" dependent variables, as follows: $\Delta\overline{RSRV}_{it}$ is a difference in the 5-year average of reserves to GDP from period *t-1* to period *t*. H_{it} includes a log of real GDP per capita and a log of real GDP per capita squared. The specification follows Rodrik (2016) in that the share of the manufacturing sector follows a hump-shaped pattern along with the development path. The share increases initially as the economy takes off and starts to industrialize. The manufacturing sector expands in terms of employment and production. However, as the development proceeds, the service sector starts to expand, and the relative size of the manufacturing sector starts to dwindle. The initial effect is controlled by the log of real GDP, and the latter by the log of real

[9] The system GMM combines the first-differences regression with the levels regression. Thus, level variables are instrumented with suitable lags of their own first differences based on the fact that these differences are uncorrelated with the country fixed effects and error terms.

GDP squared. Our model provides us with the testable hypothesis that a policy mix of reserves and capital controls would prop up the share of the manufacturing sector. Thus, we would expect the coefficients of the combined CC and $\Delta RSRV$ to be positive. Lastly, we also note that we check the robustness of our results with the annual specification, instead of incorporating a 5-year averaged variable.

2.2.3 Real Exchange Rate Undervaluation

To facilitate a comparison of our results with preceding research, we also compute a measure of real exchange rate undervaluation for our sample, following the definition in Rodrik (2008). His index of under- or overvaluation uses a measure of the domestic price level adjusted for the Balassa-Samuelson effect—in practice, nontradable goods are cheaper in poorer countries. First, we collect data on exchange rates (*XR*) and purchasing power parity conversion factors (*PPP*) from the Penn World Tables version 9.1 to calculate a "real" exchange rate (*RER*) for country *i* in period t: $\ln(RER_{it}) = \ln(\frac{XR_{it}}{PPP_{it}})$, where *XR* and *PPP* are expressed as national currency units per U.S. dollar. In the Penn World Tables, the consumption price level, equal to the PPP exchange rate divided by the nominal exchange rate (PL_CON), is available. Thus, *RER* is the inverse of PL_CON. For the robustness check, we also use the output price level (PL_GDP) to compute *RER*. A country *i*'s *RER* greater than one indicates that the currency value is lower (more depreciated) than indicated by PPP.

We then account for the Balassa-Samuelson effect by regressing log of *RER* on log of real GDP per capita (*RGDPPC*): $\ln(RER_{it}) = \alpha + \beta \ln(RGDPPC_{it}) + \rho_t + u_{it}$, where ρ_t is a period fixed effect and u_{it} is the error term. This regression yields an estimate of β ($\hat{\beta}$ of −0.55 with a high *t* statistic of around 27). Note that Rodrik (2008) gives the β coefficient, −0.24. Our results suggest a strong estimated Balassa-Samuelson effect: when incomes rise by 1 percent, the *RER* falls by around 0.55 percent. Finally, to obtain the index of undervaluation, we take the difference between the actual real exchange rate and the Balassa-Samuelson-adjusted rate, which is the predicted value of $\ln(\widehat{RER}_{it})$ from the above *RER* and *RDGPPC* regression:

$$UNDERVAL = \ln(RER_{it}) - \ln(\widehat{RER}_{it}). \quad (7)$$

UNDERVAL is comparable across countries and over time, which is centered at zero and has a standard deviation of 0.25 (see Figure 1). *UNDERVAL* greater than zero indicates that the exchange rate is set such that goods produced at home are relatively cheap in dollar terms: the currency is undervalued.

[Figure 1 about here]

3 Empirical Results: Capital Account Policy and Economic Growth

3.1. Real GDP Growth

Our first set of results documents the impact of capital controls on real GDP growth. Table 1 reports the results with 5-year averaged data. Country and period fixed effects are included to control for unobserved country-specific and time-specific components. Column (1) implements basic panel estimation with the measure of capital controls and the change in reserves included as separate regressors but not interacted. The country fixed effects estimation shows that the coefficients on capital controls and reserve accumulation both are statistically insignificant. The uninformative coefficient on capital controls reflects the inconclusiveness in past studies and the unresolved debate over the effect of financial globalization on growth. However, when we introduce the interaction term of capital controls and reserve accumulation, which is our main variable of interest, results in column (2) indicate this has a positive effect on output growth with significance at the 10% level.

[Table 1 about here]

Statistical significance becomes substantially stronger when we employ a two-step system-GMM approach to address issues of endogeneity, in columns (3)-(5). Owing to the dynamic structure of the dependent variable and its correlation with initial real GDP on the right-hand side, incumbent panel estimation may produce inconsistent results. The specification for column (3) considers initial real GDP as an endogenous or predetermined variable, where we use the lagged endogenous variable and other exogenous variables as instrument variables (the table reports the number of instruments). The estimated coefficient on the interaction term of capital control and

changes in reserves to GDP is positive and significant at the 5% level. For consistent estimation in the dynamic panel in column (3), the error $\varepsilon_{i,t}$ is required to be serially uncorrelated. AR(1) and AR(2) tests support the validity of the dynamic specification. Hansen's over-identifying restriction cannot be rejected, which supports the validity of instruments. Also, weak IV test statistics cannot reject the null of weak instruments.

In columns (4) and (5), we pursue a more flexible specification for the system GMM by considering not only initial GDP, but also the terms of trade and private credit to GDP as endogeneous or predetermined. Column (5) implements sub-sample analysis for emerging market countries. The estimated coefficients on the interaction terms of capital control and changes in reserves to GDP turn out to be more significantly positive, at the 5% level for the full sample, and at the 1% level for the emerging markets sample. Moreover, specification tests, including weak IV tests, support the validity of instruments and specifications.

Coefficient estimates for the other controls are consistent with previous studies: initial GDP is negatively related to real GDP growth except in columns (3) and (4), which supports convergence theory. The terms of trade have a positive impact on real GDP growth. The coefficient on the average of crisis events in the period is negative and significant, which implies that real GDP growth is negatively related to crisis events. Based on the results in column (4), for a country with complete capital controls, a rise in the reserves-to-GDP ratio by one percentage point leads to a 4.00 (5.16−1.16) percentage point rise in the real GDP growth rate. Interestingly, for emerging market countries in column (5), the effect of capital account policy on real GDP growth is slightly greater with full capital controls; a rise in the reserves-to-GDP ratio by one percentage point leads to a 4.04 (4.65−0.61) percentage point increase in real GDP growth rate.

One striking implication of our estimates is that capital account closedness does not necessarily imply a negative impact on growth, when considered in combination with positive reserve accumulation. This provides a counterpoint to findings in the literature, such as Bonfiglioli (2008) and Kose, Prasad, and Terrones (2009), suggesting general benefits of financial openness. While not in direct conflict with this finding, our results emphasize the importance of conditioning this conclusion on other factors, such as reserves. Closing a country's capital account potentially can be beneficial to growth if used as a means of supporting a trade surplus to promote the traded goods sector.

3.2. Productivity Growth

We now turn to productivity measures, TFP, to examine the effect of capital account policy. Table 2 reports the results with TFP collected from the Penn World Table 9.1, showing first a benchmark panel regression (column 1) and then two-step GMM to control for a dynamic panel structure (columns 2-3). In the dynamic panel, we consider not only initial TFP but also terms of trade and private credit to GDP as endogenous or predetermined variables as we did in Table 1. First of all, the results for TFP growth in all columns (1)-(3) echo our main findings in Table 1—capital controls plus reserves accumulation significantly promotes TFP growth. For example, in column (1), for a country with complete capital controls, a rise in the reserves-to-GDP ratio by one percentage point leads to a 0.42 (0.76−0.34) percentage point rise in TFP growth rate. In column (2), system GMM results show a 0.45 (0.80−0.35) percentage point rise. Results are statistically significant at 5%, respectively. For emerging market countries, our results get stronger: in column (3), a rise in reserves ratio by one percentage point leads to a 0.54 (1.04−0.50) percentage point increase in TFP growth rate for a country with complete capital controls.

Regarding coefficients on the other regressors, initial TFP is negatively related to productivity growth in columns (1) and (3), which is in line with convergence theory, while column (2) does not show a negative sign. Note that AR(1) and AR(2) tests and the Hansen over-identification test in columns (2) and (3) support not only the validity of specification but also that of instruments. A weak IV test also rejects the null of weak instruments in columns (2) and (3).

[Table 2 about here]

Table 3 extends the examination of effects on productivity to consider labor productivity at the disaggregated sectoral level. Sectors now include agriculture, mining, manufacturing, construction, business services, personal services, trade services, utilities, and government. Table 3 shows that most of the sectors are muted in response to reserve accumulation combined with capital controls. We find that only the labor productivity of the manufacturing sector responds to the capital account policy positively in column (3). The results of the interaction term of capital controls and reserves changes in manufacturing are significant at the 1% level, and also support the validity of instruments.

[Table 3 about here]

Our finding that capital account policy can raise GDP and productivity, specifically for the manufacturing sector, is consistent with a mechanism of learning by doing prevalent in preceding literature. As has been argued in Rodrik (2008), for example, a policy of currency undervaluation could be expected to generate a trade surplus and thereby raise production of the traded goods sector, often associated with manufacturing. If there is a learning by doing externality associated with this sector, such a policy may raise productivity in this sector, and thereby raise overall productivity and output. Clearly, a capital account policy raising reserves could be part of a policy to engineer currency undervaluation as envisioned in the mechanism above. The next section will provide a more explicit comparison with earlier work focusing on exchange rate policy rather than capital account policy, and the section following that will provide evidence regarding the prediction arising from the mechanism regarding sectoral reallocation.

3.3. Robustness

Table 4 conducts robustness checks for our main results for an extended sample ending in 2014. Thus, our sample now includes the periods containing the Global Financial Crisis. During the crisis, characteristics and the consequent adjustment of reserves would be different from those during tranquil times. Also, adjustment motivated by the *learning-by-doing* externality might not be expressed during volatile times. However, our results are generally robust to the inclusion of the period and are even stronger for some analysis. Table 4 shows the results.[10] Effects of the reserves and capital controls combined on real GDP and TFP growth are still positive, although the magnitude has decreased somewhat.

[Table 4 about here]

[10] Due to limited availability of institutional quality (up to 2007), we exclude it from our robustness check for theexpanded period 1985-2014. However, when including the institutional quality by interpolating for 2010-2014, results do not change.

4 Comparison with Real Exchange Rate Undervaluation

We now provide a comparison of our results to an alternative specification, as used in previous work, which used real exchange rate undervaluation instead of capital account policy as a regressor. The two approaches clearly are related, since the capital account policy with reserve accumulation can be used as a means of maintaining an undervalued currency and thereby boosting demand for the traded goods sector through trade surplus. But we argue below that there are benefits, both practical and conceptual, to using a measure of capital account policy as the regressor in an empirical investigation. As discussed above, we apply the definition of real exchange rate undervaluation from Rodrik (2008) to our sample of countries.

Results reported in Table 5 echo the main finding of Rodrik of a positive effect of undervaluation on real GDP growth, though significance is substantially weaker for our sample. Significance is strongest (at the 10% level) in column (2) when we tailor our sample to end in the year Rodrik's sample ends (2004). The significance weakens (p-value=0.219) using our main sample range (ending in 2007). We note that our sample has fewer countries and a later starting date than Rodkrik. Further, Table 5 shows that the result is not robust when the sample focuses on emerging markets, when alternative measures of undervaluation considered in Rodrik (2008) are used, or most importantly, when the set of controls is expanded to the full set of regressors used in our main regressions. We conclude that the estimated effect of real exchange rate undervaluation on growth is distinctly less clear and less robust in our sample than what we found in our benchmark growth regressions using a measure of capital account policy as a regressor.

[Table 5 about here]

Further evidence of a relative disadvantage of using currency undervaluation as a regressor comes from regressions with TFP as the dependent variable. As shown in Table 6, we are not able to find any significant positive effect of currency undervaluation on TFP growth for any alternative measures or regression specifications. This result contrasts with the strong significance we found in regressions using capital account policy as a regressor reported in Table 2.

[Table 6 about here]

The weaker results we obtain when using undervaluation as a regressor may reflect certain inherent difficulties in measuring real exchange rate undervaluation. Firstly, the exchange rate is an endogenous and volatile variable that responds to a wide range of financial market forces. Even Rodrik (2008) acknowledges this issue, and appeals to the idea of a capital account policy behind the currency undervaluation he studies, though he does not take the step of measuring this policy directly. If the objective of the researcher is to study policies to promote growth, it is arguably more fruitful to study the actual government capital and reserves policies, rather than study the behavior of an economic variable like the exchange rate, which is the endogenous and rather noisy outcome of that policy.

Second, measuring undervaluation requires a measure of the equilibrium exchange rate, which is inherently dependent upon contestable theoretical assumptions. For example, the measurement of undervaluation in Rodrik (2008) is the product of computation using regressions of the real exchange rate on output, based on the theory of Balassa and Samuelson. In contrast, our use of reserve accumulation sidesteps this tricky inference and computation, since reserve accumulation usually can be measured directly. Further, it is highly problematic that the connection of exchange rates to a possible trade surplus depends fundamentally on the values of substitution elasticities in the demands for foreign versus home goods, which are hotly contested in the literature. In contrast, the connection of reserve accumulation to trade balances works through the balance of payments identity, so the connection is arguably much more direct and independent of assumptions about consumer behavior or ambiguous elasticities. In particular, if we write the balance of payments identity as:

$$-KA = \ CA$$

or equivalently as

$$\begin{aligned}\Delta\text{offical reserve holdings} + \ \Delta\text{private net asset holdings} \\ = \text{net exports} + \ \text{net interest income} + \text{unilateral transfers}\end{aligned}$$

then in the context of capital controls fully precluding private international asset trade, the capital account is driven purely by official reserve transactions. If we abstract from unilateral transfers, the current account is driven by net exports, net of interest income, which under the strong capital controls assumption above would be limited to interest on reserves holdings. In sum, the

accounting identity indicates a tight connection between reserve accumulation (net of interest income on past reserve accumulation) and a trade surplus, regardless of the particular changes in relative prices needed to implement this for a given set of elasticities.

5 Capital Account Policy and Sectoral Reallocation

Next, we investigate the implications of capital account policy for the sectoral allocation of labor, as this sheds light on the mechanism by which a capital account policy can raise productivity by favoring the manufacturing (traded) sector.

Figure 2 shows how the development path and the share of the manufacturing sector are linked by plotting each country's manufacturing labor- and real valued-added shares and (log) real GDP per capita with 5-year averaged data. As documented in Rodrik (2016), the share of the manufacturing sector, in terms of employment and real value-added, follows a hump-shaped pattern along with the development path. At the initial stage of industrialization, the share increases as the economy starts to take off. Manufacturing expands as employment is reallocated from the agricultural sector to the manufacturing sector. This development continues until it hits a threshold, at which the economy starts to transform from manufacturing to the service sector. In our regression analysis, the initial positive correlation is captured with the log of real GDP per capita, and the subsequent negative transformation is captured by introducing the log of real GDP per capita squared.

In Figure 2, we can see the hump-shaped pattern along with the real GDP per capita. At the same time, we can see that there is a wide variety of paths among countries. Most notably, some countries, such as Korea, Thailand, and China show a much higher share of manufacturing than other economies. We claim that capital account policy is systematically correlated with these heterogeneous paths.

[Figure 2 about here]

Table 7 shows regression results regarding sectoral reallocation. First, Panel A reports our main results with 5-year averaged data. In columns (1) and (3) of Panel A, we show the results for labor and the real value-added shares of the manufacturing sector, respectively. For the robustness check,

columns (2) and (4) include an alternative reserves-to-GDP variable: we slightly modify our reserve variable, because we are focusing on the "level" dependent variables, as follows: $\Delta\overline{RSRV}_{it}$ is a difference in 5-year average of reserves to GDP from period *t-1* to period *t*. As in growth analysis, we find that capital account policy is positively associated with the share of employment in the manufacturing (tradable goods) sector. In column (1), in an economy where reserve accumulation to GDP is higher by one percentage point with full capital account restriction, the labor share allocated to the manufacturing sector is higher by 0.46 (0.82−0.36) percentage point. Shifting labor into the sector then results in a larger scale of production in columns (3) and (4). Specifically, in column (3), if reserve accumulation to GDP is higher by one percentage point with full capital account restriction, real value-added manufacturing goods sector will increase by 0.86 (1.38−0.52) percentage point. We can confirm that the same mix of capital account policy that enhances the economic growth in the manufacturing sector also boosts employment and production within the manufacturing sector.

[Table 7 about here]

As in Rodrik (2016), the share of labor and real value-added in the manufacturing sector initially rises with real GDP, but then decreases as the economy expands, as implied by the negative coefficients on the squared real log GDP terms in our estimates. On top of the development path, one can see that the combined reserves and capital controls play an important role and further provide a systemic wedge in explaining shares of the manufacturing sector.

To consider robustness, we re-do this regression using annual data. In columns (1) and (2) of Panel B, we see that capital controls interacted with reserves to GDP growth yield positive coefficients, while reserves to GDP growth itself yields negative coefficients. The results are all statistically significant at the 5% level. Thus if one economy closed its capital account fully, increases in the reserves-to-GDP ratio lead to the expansion of the scale of the manufacturing sector. In Panel B, column (1), a one percentage point increase in reserves to GDP leads to 0.045 (0.144−0.099) percentage point increase in the labor share of the manufacturing sector, combined with full capital controls. Also, in column (2), a one percentage point increase in reserves to GDP leads to 0.152 (0.251−0.099) percentage point increase in real value-added shares of the manufacturing sectors with full capital controls. Again, one might want to see the effect of

accumulated (thus, the stock of) reserves on the share of labor or real value-added of the manufacturing sector.

In our final remarks, we discuss the possibility of capital account policy countering *deindustrialization*. Rodrik (2016) documents the premature industrialization of emerging economies; he claims that the hump-shaped relationship between labor share and incomes has shifted downward in Latin American countries, but not in Asian countries. In our sample, Asian countries tend to be in the group of countries with high reserves and relatively severe financial account restrictions. It is possible that the capital account policies adopted by these countries favor the manufacturing sector and exploit the externality from the tradable sector. Additionally, these policy tools feed the productivity growth in the tradable goods sector along with the current account surplus. We could not account for how long the externality persists, but up until the Global Financial Crisis, the effect of the policy adoption seemed positive on growth.

6 Conclusion

Using panel data from 45 countries during the 1985–2014 period, we find that a combination of capital controls and reserve accumulation contributes to the growth of real GDP and TFP, and that these gains are associated with sectoral reallocation toward manufacturing. It has long been argued that the manufacturing sector can function as a workhorse for economic growth. Our contribution is to show that a particular capital account policy that combines capital controls and reserves accumulation can contribute to this process of growth, and that this policy is positively associated with labor productivity growth in the manufacturing sector and with labor reallocation to this sector. We thus find a linkage between capital account policy in financial markets and theories of *Learning-by-doing* in the tradable (manufacturing) sector of goods markets. By encouraging external saving and simultaneous increase in net exports through currency undervaluation, the relative scale of domestic production to absorption of the economy will be larger than one in a *laissez-faire* economy.

Our results have implications for the expansive debate regarding the benefits of financial globalization. Past work has documented scenarios where financial openness could promote growth in emerging markets, by reducing financial constraints and facilitating the accumulation of capital. In a counterpoint, our findings document a scenario where the opposite conclusion holds

sway, where a policy of financial deglobalization combined with an open goods market can promote export-led growth. Our results also are of interest to the expansive literature on growth, and the macro polices that have positive effects on growth in emerging markets.

We do not make claims as to whether such a capital account policy is optimal from the stance of international cooperation, or whether the policy combination is fine-tuned by policy makers. It is possible that policy makers in emerging economies pursue reserve accumulation primarily to intervene in their nominal exchange rate market and impose a restriction on the capital account for political motivations. Nonetheless, regardless of motivation, we find that this policy mix has served to spur the growth of those economies through a larger scale of the manufacturing sector. It is still unclear, though, how sustainable over time such a policy combination can be. We leave such questions as an agenda for future research.

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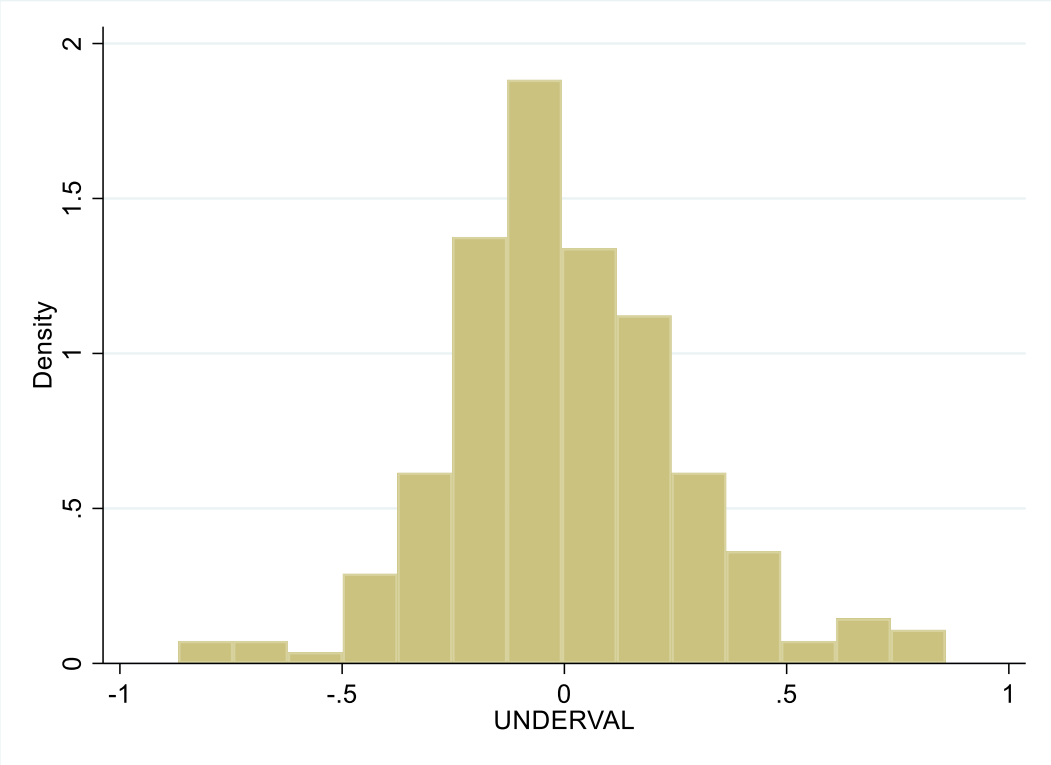
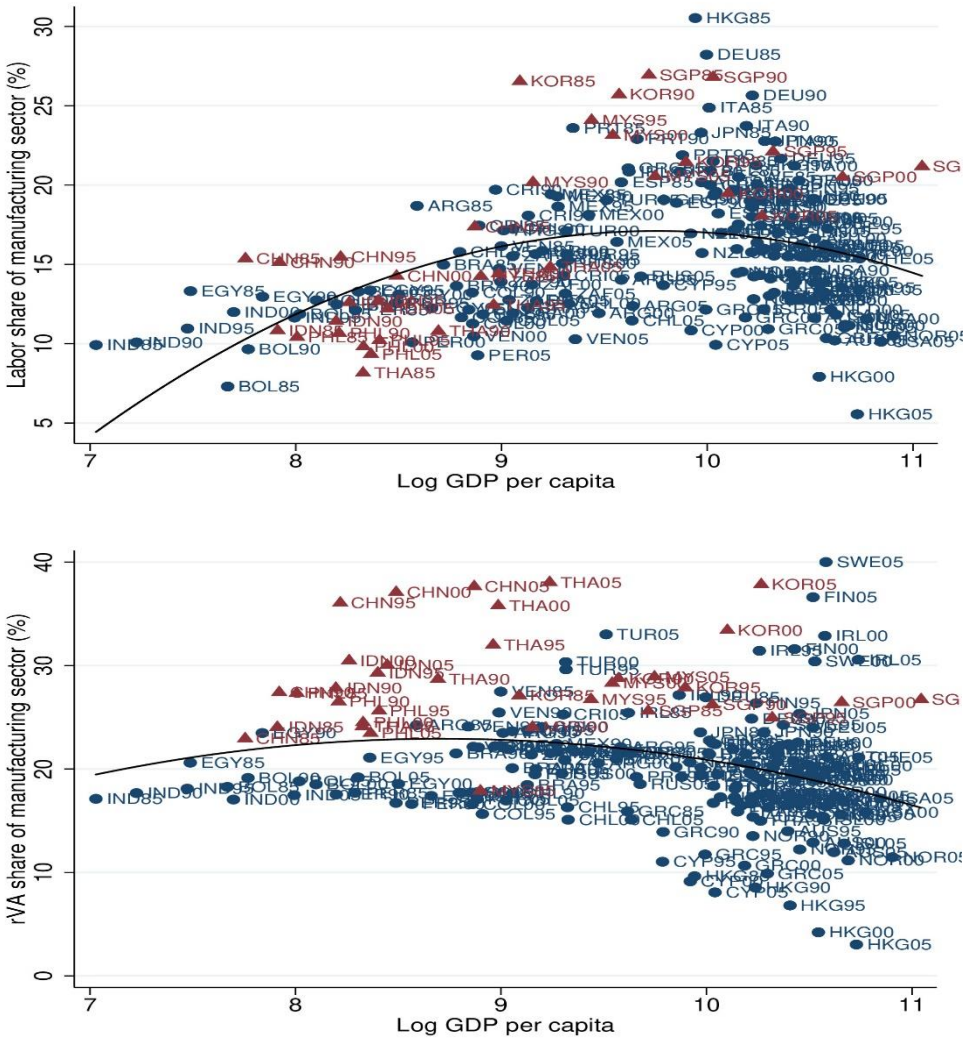
Figure 1. Distribution of undervaluation measures



Notes: authors' calculation

Figure 2. Development and the share of manufacturing sector



Notes: Labor and real value added shares of manufacturing sectors are depicted. We take the average of 1985-1990, 1990-1995, 1995-2000, 2000-2005 and 2005-2007. Data come from several sources, including PWT, KLEMS, WIOD, OECD STAN, and GGDC 10 sector. Triangle symbols in red indicate East Asian countries.

Table 1. Capital account policy and economic growth: 5-year averaged data

	(1)	(2)	(3)	(4)	(5)
Dependent variable	RGDP growth				
Method	Panel within		System GMM		
Sample	Full	Full	Full	Full	Emerging markets
Initial GDP	-0.3094*	-0.3029*	0.0117	0.0161	-0.0155
	(0.1231)	(0.1134)	(0.0226)	(0.0255)	(0.0336)
Capital controls	0.0267	0.0241	0.0453	0.0483	-0.0124
	(0.0410)	(0.0404)	(0.0377)	(0.0449)	(0.0776)
d.Reserves to GDP	0.8275	-0.5809	-0.8466	-1.1615	-0.6072
	(0.7730)	(0.7724)	(1.2952)	(1.1532)	(1.0382)
Capital controls	--	3.5204*	4.7327**	5.1606**	4.6508***
× d.Reserves to GDP		(1.4364)	(2.2983)	(2.1524)	(1.3054)
Private credit/GDP	-0.0067	-0.0032	-0.0469	-0.0333	0.0006
	(0.0327)	(0.0272)	(0.0314)	(0.0433)	(0.0746)
(log) terms of trade	0.0920	0.0927	0.0809*	0.2070**	0.2592***
	(0.0603)	(0.0620)	(0.0480)	(0.0982)	(0.0948)
Trade openness	0.0843	0.0526	0.0280	0.0341*	-0.0091
	(0.0699)	(0.0734)	(0.0172)	(0.0196)	(0.0202)
Population growth	-1.4147	-1.5502	2.0028	2.8949*	-0.5240
	(1.6515)	(1.7593)	(1.8609)	(1.6581)	(2.9191)
Human capital	0.0028	0.0043	-0.0003	-0.0007	-0.0013
	(0.0050)	(0.0051)	(0.0028)	(0.0027)	(0.0036)
Institution quality	0.0084	0.0075	0.0147	0.0131	0.0182
	(0.0135)	(0.0139)	(0.0102)	(0.0087)	(0.0139)
Crisis	-0.1463**	-0.1522**	-0.1226***	-0.1551***	-0.0718
	(0.0383)	(0.0423)	(0.0466)	(0.0423)	(0.0465)
Country FE	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	Yes
AR(1) (p-value)			0.003	0.002	0.012
AR(2) (p-value)			0.532	0.316	0.666
Weak IV (p-value)			0.7	0.08/0.04/0.00	0.15/0.00/0.03
Over-id test (p-value)			0.293	0.713	0.973
# of instruments			19	24	25
# of countries	45	45	45	45	23
Observations	186	186	186	186	108
R-squared	0.621	0.635	--	--	--

Notes: Panel FE estimation results are reported in columns (1) and (2). Two step system GMM results are in columns (3)-(5). Initial GDP alone is considered endogenous in column (3). Initial GDP, the terms of trade and private credit to GDP are considered endogenous or predetermined in columns (4)-(5). Weak IV test reports Sanderson-Windmeijer multivariate F test of excluded instruments for initial GDP, TOT, Prv. Credit/GDP, respectively. Clustered robust standard errors at the country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%.

Table 2. Capital account policy and TFP growth: 5-year averaged data

	(1)	(2)	(3)
Dependent variable		TFP growth	
Method	Panel within	System GMM	System GMM
Sample	Full	Full	Emerging markets
Initial GDP	-0.0895***	0.0230	-0.0173
	(0.0184)	(0.0758)	(0.0499)
Capital controls	0.0074	0.0068	0.0086
	(0.0071)	(0.0067)	(0.0130)
d.Reserves to GDP	-0.3366**	-0.3540**	-0.5049
	(0.1446)	(0.1580)	(0.3432)
Capital controls	0.7564**	0.7989**	1.0350**
× d.Reserves to GDP	(0.2907)	(0.3218)	(0.5089)
Private credit/GDP	-0.0070	-0.0123	-0.0096
	(0.0062)	(0.0091)	(0.0155)
(log) terms of trade	0.0007	0.0097	-0.0113
	(0.0058)	(0.0115)	(0.0391)
Trade openness	0.0029	0.0072**	0.0088**
	(0.0083)	(0.0031)	(0.0037)
Population growth	-0.4465	-0.7514**	-0.9456***
	(0.2669)	(0.3662)	(0.3192)
Human capital	0.0010	0.0009**	0.0006
	(0.0006)	(0.0003)	(0.0005)
Institution quality	-0.0002	-0.0009	-0.0012
	(0.0011)	(0.0013)	(0.0036)
Crisis	-0.0090*	-0.0154***	-0.0114
	(0.0046)	(0.0060)	(0.0108)
Country FE	Yes	Yes	Yes
Period FE	Yes	Yes	Yes
AR(1) (p-value)		0.038	0.012
AR(2) (p-value)		0.772	0.890
Weak IV (p-value)		0.09/0.00/0.01	0.09/0.00/0.1
Over-id test (p-value)		0.386	0.143
# of instruments		21	22
Number of ifs	45	45	23
Observations	186	186	108
R-squared	0.597	--	--

Notes: Two-step system GMM results are reported in columns (2)-(3). Initial GDP, the terms of trade (TOT), and private credit to GDP are considered endogenous or predetermined in columns (2)-(3). Weak IV test reports Sanderson-Windmeijer multivariate F test of excluded instruments for initial GDP, TOT, and Prv. Credit/GDP, respectively. Clustered robust standard errors at country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%.

Table 3. Sectoral labor productivity growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable	Sectoral labor productivity growth								
	Agriculture	Mining	Manufacturing	Construction	Business Services	Personal Services	Trade Services	Utilities	Government
Initial GDP	0.0035	0.0063	0.0129	-0.0022	-0.0050	-0.0028	0.0079	-0.0129*	-0.0197*
	(0.0048)	(0.0163)	(0.0089)	(0.0052)	(0.0123)	(0.0073)	(0.0127)	(0.0067)	(0.0111)
Capital controls (CC)	0.0209	0.0150	-0.0091	0.0344**	0.0425*	0.0135	-0.0167	0.0567	0.0575**
	(0.0170)	(0.0486)	(0.0275)	(0.0137)	(0.0229)	(0.0284)	(0.0364)	(0.0360)	(0.0293)
d.Reserves to GDP	-0.5420	0.8588	-0.1188	0.5906	-0.3741	-0.4784	-0.2819	0.7195	-0.3627
	(0.4548)	(1.0250)	(0.3148)	(0.4212)	(0.4896)	(0.4291)	(0.4599)	(0.5707)	(0.5086)
CC × d.Reserves to GDP	0.9036	-0.8787	1.4270***	-0.6584	-0.3314	1.2488	0.9684	-1.3599	0.4938
	(0.7753)	(1.9641)	(0.5298)	(0.8566)	(0.8773)	(0.7933)	(1.1197)	(0.8432)	(0.8134)
Private credit/GDP	-0.0244	0.0237	-0.0131	-0.0152	0.0194	-0.0119	-0.0245	0.0599	0.0474*
	(0.0289)	(0.0440)	(0.0169)	(0.0268)	(0.0317)	(0.0271)	(0.0398)	(0.0449)	(0.0260)
(log) terms of trade (TOT)	-0.0489	0.0819	0.0892	0.0579	-0.0097	-0.0303	0.2193*	-0.0422	-0.1748
	(0.0655)	(0.1855)	(0.0717)	(0.0687)	(0.0960)	(0.0901)	(0.1234)	(0.0908)	(0.1068)
Trade openness	0.0011	0.0027	0.0063	-0.0016	0.0044	0.0102*	0.0009	0.0018	-0.0079
	(0.0059)	(0.0145)	(0.0049)	(0.0086)	(0.0065)	(0.0054)	(0.0106)	(0.0073)	(0.0122)
Population growth	-1.4058**	-2.0934	-0.0816	-1.4921**	0.4494	0.8713	0.5738	0.3586	-0.9630
	(0.5691)	(2.2219)	(0.5986)	(0.6297)	(0.7520)	(0.7777)	(1.3806)	(1.0401)	(1.3177)
Human capital	-0.0217*	-0.0200	-0.0204	-0.0423**	-0.0627**	-0.0078	-0.0440**	-0.0157	-0.0130
	(0.0130)	(0.0294)	(0.0160)	(0.0169)	(0.0280)	(0.0229)	(0.0190)	(0.0227)	(0.0213)
Institution quality	-0.0000	-0.0007	0.0001	-0.0008	0.0002	0.0010	0.0008	0.0013	-0.0014
	(0.0009)	(0.0017)	(0.0013)	(0.0008)	(0.0023)	(0.0013)	(0.0016)	(0.0018)	(0.0011)
Crisis	0.0001	0.0070	0.0012	0.0030	-0.0024	0.0016	0.0012	-0.0065**	0.0004
	(0.0035)	(0.0091)	(0.0033)	(0.0050)	(0.0051)	(0.0055)	(0.0046)	(0.0033)	(0.0048)
Country & Period FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)/ AR(2) (p-value)	0.002/0.598	0.005/0.6	0.001/0.961	0.021/0.273	0.022/0.832	0.07/0.599	0.011/0.361	0.002/0.67	0.028/0.051
Weak IV (# of valid instruments, p-val<0.1)	0.13/0.11/0.06	0.36/0.17/0.31	0.11/0.01/0.04	0.23/0.17/0.19	0.44/0.43/0.26	0.5/0.02/0.31	0.79/0.79/0.78	0.44/0.43/0.42	0.04/0.02/0.00
Over-id test (p-value)	0.212	0.446	0.608	0.234	0.433	0.605	0.869	0.693	0.144
# of instruments	19	19	19	19	19	19	19	19	19
# of countries	45	43	45	45	44	39	45	44	37
Observations	180	175	177	180	176	160	180	177	141

Notes: Two-step system GMM results are reported in all columns. Initial GDP, the terms of trade (TOT), and private credit to GDP are considered endogenous variables. Weak IV test reports Sanderson-Windmeijer multivariate F test of excluded instruments for initial GDP, TOT, and Prv.credit/GDP, respectively. Clustered robust standard errors at the country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%.

Table 4. Robustness check: capital account policy and growth, 1985-2014

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	RGDP growth			TFP growth		
Method	Panel within	System GMM	System GMM	Panel within	System GMM	System GMM
Sample	All	All	Emerging markets	All	All	Emerging markets
Initial GDP	-0.1910***	0.0109	0.0050	-0.0691***	-0.0164	-0.0585
	(0.0594)	(0.0580)	(0.1464)	(0.0197)	(0.0372)	(0.0454)
Capital controls	0.0248	0.0341	-0.0360	0.0082*	0.0061	0.0063
	(0.0411)	(0.0428)	(0.1832)	(0.0045)	(0.0050)	(0.0042)
d.Reserves to GDP	-0.8204	-1.0553	-1.0914	-0.0484	-0.0475	-0.1141
	(0.5559)	(0.7942)	(0.7444)	(0.0645)	(0.0696)	(0.0735)
Capital controls	2.1693**	3.1412*	3.5948**	0.2081*	0.2805*	0.2795*
× d.Res. to GDP	(0.9980)	(1.6533)	(1.5434)	(0.1202)	(0.1702)	(0.1443)
Private credit/GDP	-0.0681*	-0.1050	-0.0728	-0.0041	-0.0091**	-0.0145**
	(0.0352)	(0.0646)	(0.0574)	(0.0038)	(0.0046)	(0.0063)
(log) terms of trade	0.0453	0.0367	0.0655	-0.0014	-0.0004	-0.0081
	(0.0445)	(0.0505)	(0.0485)	(0.0039)	(0.0074)	(0.0076)
Trade openness	0.0067	0.0451*	0.0155	0.0045	0.0027*	0.0060**
	(0.0440)	(0.0245)	(0.0309)	(0.0060)	(0.0016)	(0.0028)
Population growth	-0.8052	0.1002	0.7677	-0.5375*	-0.5991***	-0.7676**
	(1.7475)	(2.8475)	(5.8138)	(0.2817)	(0.1914)	(0.3323)
Human capital	-0.0010	-0.0003	-0.0009	-0.0000	0.0004	0.0000
	(0.0035)	(0.0020)	(0.0040)	(0.0005)	(0.0002)	(0.0002)
Crisis	-0.1451***	-0.1215***	-0.1056*	-0.0084***	-0.0103***	-0.0071
	(0.0254)	(0.0318)	(0.0596)	(0.0029)	(0.0035)	(0.0061)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	Yes	Yes
AR(1) (p-value)		0.002	0.01		0.004	0.017
AR(2) (p-value)		0.259	0.194		0.928	0.585
Weak IV (p-value)		0.04/0.00/0.00	0.03/0.00/0.00		0.02/0.00/0.00	0.29/0.15/0.24
Over-id test (p-value)		0.378	0.392		0.584	0.601
# of instruments		25	25		19	22
# of countries	45	45	23	45	45	23
Observations	231	231	131	231	231	131
R-squared	0.569	--	--	0.514	--	--

Notes: Two step system GMM results are reported in columns (2), (3), (5), and (6). Initial value, the terms of trade and private credit to GDP are considered endogenous or predetermined. Weak IV test reports Sanderson-Windmeijer multivariate F test of excluded instruments for initial GDP, TOT, and Prv. Credit/GDP, respectively. Clustered robust standard errors at the country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%

Table 5. Real exchange rate undervaluation and real GDP growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	RGDP growth						
	Panel FE	Panel FE	Panel FE	Panel FE	System GMM		
	1985-2007	1985-2004	Emerging markets, 1985-2007	w/ more controls, 1985-2007	w/ more controls, 1985-2007	Alternative Underval1 (log of 5 yrs avg. RER)	Alternative Underval2 (using GDP deflator)
Initial value	-0.3743***	-0.4532***	-0.4725***	-0.3217***	0.0530	0.0508	0.0532
	(0.0738)	(0.0629)	(0.0882)	(0.0798)	(0.0582)	(0.0584)	(0.0568)
UNDERVAL	0.0765	0.1263*	0.0842	0.0120	0.0465	0.0511	0.0410
	(0.0614)	(0.0745)	(0.0792)	(0.0720)	(0.1207)	(0.1232)	(0.1236)
Private credit/GDP				-0.0023	-0.0126	-0.0128	-0.0117
				(0.0378)	(0.0551)	(0.0558)	(0.0561)
(log) terms of trade				0.0931	0.1039	0.1049	0.1045
				(0.0588)	(0.1086)	(0.1089)	(0.1066)
Trade openness				0.0924	0.0457	0.0439	0.0458
				(0.0912)	(0.0441)	(0.0440)	(0.0424)
Population growth				-1.6677	3.7099	3.6446	3.6602
				(2.0837)	(2.3301)	(2.3254)	(2.2339)
Human capital				0.0032	-0.0025	-0.0024	-0.0024
				(0.0058)	(0.0035)	(0.0035)	(0.0031)
Institution quality				0.0048	0.0058	0.0058	0.0063
				(0.0087)	(0.0103)	(0.0104)	(0.0104)
Crisis				-0.1407***	-0.1402***	-0.1402**	-0.1393***
				(0.0348)	(0.0544)	(0.0552)	(0.0536)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(1) (p-value)					0.002	0.002	0.002
AR(2) (p-value)					0.597	0.589	0.595
Weak IV (p-value)					0.04/0.15/ 0.05/0.00	0.04/0.19/ 0.08/0.00	0.05/0.12/ 0.06/0.00
Over-id test (p-value)					0.371	0.345	0.390
# of instruments					18	18	18
# of countries	45	45	23	45	45	45	45
Observations	224	179	114	186	186	186	186
R-squared	0.502	0.595	0.629	0.611	--	--	--

Notes: Two step system GMM results are reported in columns (5)-(7). Initial GDP, the terms of trade (TOT), private credit to GDP and UNDERVAL are considered endogenous or predetermined. Weak IV test reports Sanderson-Windmeijer multivariate F test of excluded instruments for initial GDP, TOT, Prv. Credit/GDP, and UNDERVAL, respectively. Clustered robust standard errors at the country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%.

Table 6. Real exchange rate undervalution and TFP growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	TFP growth						
	Panel FE	Panel FE	Panel FE	Panel FE	System GMM		
	1985-2007	1985-2004	Emerging markets, 1985-2007	w/ more controls, 1985-2007	w/ more controls, 1985-2007	Alternative Underval1 (log of 5 yrs avg. RER)	Alternative Underval2 (using GDP deflator)
Initial value	-0.1184***	-0.1386***	-0.1389***	-0.0791***	0.0909	0.0853	0.0931
	(0.0243)	(0.0263)	(0.0340)	(0.0237)	(0.1093)	(0.1112)	(0.1109)
UNDERVAL	-0.0007	0.0021	-0.0050	-0.0045	0.0060	0.0080	0.0055
	(0.0077)	(0.0076)	(0.0089)	(0.0086)	(0.0169)	(0.0173)	(0.0164)
Private credit/GDP				-0.0095	-0.0115	-0.0111	-0.0114
				(0.0061)	(0.0083)	(0.0083)	(0.0083)
(log) terms of trade				0.0015	0.0120	0.0114	0.0124
				(0.0061)	(0.0165)	(0.0167)	(0.0166)
Trade openness				0.0151	0.0051*	0.0047	0.0053*
				(0.0106)	(0.0031)	(0.0031)	(0.0030)
Population growth				-0.3689	-0.9049**	-0.8944**	-0.9216**
				(0.2663)	(0.4034)	(0.4116)	(0.4147)
Human capital				0.0006	0.0008*	0.0007*	0.0008**
				(0.0006)	(0.0004)	(0.0004)	(0.0004)
Institution quality				-0.0001	-0.0015	-0.0015	-0.0015
				(0.0012)	(0.0018)	(0.0019)	(0.0018)
Crisis				-0.0061	-0.0149**	-0.0144**	-0.0150**
				(0.0044)	(0.0068)	(0.0068)	(0.0067)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(1) (p-value)					0.027	0.029	0.026
AR(2) (p-value)					0.804	0.806	0.799
Weak IV (p-value)					0.35/0.35/ 0.04/0.13	0.40/0.42/ 0.09/0.21	0.27/0.22/ 0.03/0.09
Over-id test (p-value)					0.709	0.665	0.720
# of instruments					18	18	18
# of countries	45	45	23	45	45	45	45
Observations	224	179	114	186	186	186	186
R-squared	0.502	0.595	0.629	0.611	--	--	--

Notes: Two step system GMM results are reported in columns (5)-(7). Initial GDP, the terms of trade, private credit to GDP and UNDERVAL are considered endogenous or predetermined. Weak IV test reports Sanderson-Windmeijer multivariate F test of excluded instruments for initial GDP, TOT, Prv. Credit/GDP, and UNDERVAL, respectively. Clustered robust standard errors at the country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%.

Table 7. Captial account policy and its channels in manufacturing sectors

Panel A. 5 year averaged data

	(1)	(2)	(3)	(4)
Dependent variable	Employment share, manufacturing		Real value-added share, manufacturing	
Reserves variable		$\Delta\overline{RSRV}_{it}$		$\Delta\overline{RSRV}_{it}$
Capital controls	0.0121	0.0137	0.0360**	0.0171
	(0.0156)	(0.0110)	(0.0143)	(0.0135)
d.Reserves to GDP	-0.3585	-0.0930**	-0.5186***	-0.1153**
	(0.2554)	(0.0355)	(0.1760)	(0.0526)
Capital controls × d.Reserves to GDP	0.8172*	0.1327**	1.3788***	0.3533***
	(0.4810)	(0.0545)	(0.4768)	(0.1196)
log rGDP per capita	-0.2289***	-0.1991***	-0.0101	0.0041
	(0.0584)	(0.0475)	(0.0699)	(0.0649)
log rGDP per capita squared	-0.0243***	-0.0225***	-0.0067	-0.0028
	(0.0056)	(0.0046)	(0.0074)	(0.0068)
Country FE	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes
Observations	208	173	209	172
R-squared	0.866	0.915	0.886	0.935

Notes: In columns (1) and (3), $\Delta RSRV_{it}$ a 5-year average of annual differences in reserves to GDP in the period t. In columns (2) and (4), $\Delta\overline{RSRV}_{it}$ is a difference in 5-year average of reserves to GDP from period *t-1* to period *t*.

Panel B. Annual data

Dependent variable	Employment share, manufacturing	Real value added share, manufacturing
	(1)	(2)
Capital controls	0.010	0.025**
	(0.012)	(0.012)
d.Reserves to GDP	-0.099**	-0.099**
	(0.038)	(0.043)
Capital controls	0.144**	0.251**
× d.Reserves to GDP	(0.065)	(0.104)
log rGDP per capita	0.447***	0.153
	(0.092)	(0.163)
log rGDP per capita squared	-0.025***	-0.006
	(0.005)	(0.009)
Country FE	Yes	Yes
Year FE	Yes	Yes
R-squared	0.869	0.886
Observations	879	877

Notes: : Clustered robust standard errors at country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%, respectively.

Appendix

A.1 Data Construction

For real GDP and TFP growth, we incorporate *Penn World Table* 9.1. And For real undervaluation, we incorporate Penn World Table 9.1. More specifically, we use *rgdpe* as our baseline gdp measure and use *rtfpna* for tfp measure. For the real exchange rate, we incorporate *PL_CON* divided by the nominal exchange rate to USD as our baseline measure.

For sectoral value added, price index, and labor, we construct our data from four different sources, WIOD, KLEMS, GGDC and STAN. First, we take the WIOD November 2016 release as our baseline benchmark, and then supplement the WIOD July 2014 release.[11][12] We take the manufacturing sector as a tradable goods sector, and all other sectors as a non-tradable goods sector. For the manufacturing sector, we aggregate C10-C12 to C33 of ISIC Rev.4 code; and 15t16 to 36t37 of ISIC Rev.3 code. We further combine EU KLEMS, GGDC, and STAN from the OECD data. We take EU KLEMS Growth and Productivity Accounts, March 2007 Release as our benchmark ones for KLEMS data.[13] The sectoral data is constructed based on ISIC Rev.3. For the manufacturing sector, we aggregate the following industries; 15t16 to 36t37. Groningen Growth and Development Centre(GGDC) 10-sector data comes with three variables, VA, QVA, and EME, which stands for valued added, value added at constant 2005 prices, and persons engaged.[14] Sectoral deflator is calculated by dividing VA with QVA. We use EME for our measure for labor. Lastly, we combine STAN from the OECD data for Norway, Switzerland, New Zealand, Iceland, and Israel.[15] We use SNA08, ISIC Rev.4 data as our benchmark data and supplement with SNA93, ISIC Rev.3 data if needed. For the manufacturing sector, we aggregate D10T33 of ISIC Rev.4 code; and 15tt37 of ISIC Rev.3 code.

Nominal value added in national currencie are deflated by sectoral price deflators to get the real value added (except for GGDC) To cover as many observations as possible, we directly incorporate nominal value added and the deflator, instead of incorporating gross output and intermediate input using respective price indices. We note that nominal value added is denominated in current national currencies(millions). Price deflator index is re-anchored at 1995=100. For labor, we use the number of employement engaged(thousands). Manufacturing or non-manufacturing data is aggregated using the share of current nominal value added. For a few countries, slight discrepancies between ISIC Rev.3 and ISIC Rev.4 or between different sources of data rise. To prevent the discontinuity of the series, we impute the data using the growth rate of the supplement data.

KLEMS data from 1985 to 2005 and WIOD from 2005 to 2014 covers the United States, the United Kingdom, Belgium, Denmark, France, Germany, Italy, Netherland, Sweden, Japan, Finland, Greece, Ireland, Portugal, Spain. STAN data covers Norway(1989-2014), Switzerland, New Zealand(1989-2014), Iceland(1991-2014), and Israel(2000-2007). WIOD data from 1995 to 2014 covers Canada, Turkey, Australia, Argentina, Russia. GGDC data from 1985 to 2010 covers Bolivia, Chile, Colombia, Peru, Egypt, Hong Kong, Malaysia, Philippines, Singapore, Thailand. GGDC data from 1985 to 1994 and WIOD from 1995 50 2014 covers Brazil, Mexico, Indonesia, India, Korea and China. Table A1 shows the list of the countries.

[11] http://www.wiod.org/home.
[12] Please see Timmer et al. (2015) for further details.
[13] http://www.euklems.net/.
[14] https://www.rug.nl/ggdc/productivity/10-sector.
[15] http://www.oecd.org/industry/ind/stanstructuralanalysisdatabase.

Table A1. List of countries [45 countries, 1985-2007 (2014)]

Advanced countries		Emerging market countries	
Australia	Italy	Argentina	Indonesia
Austria	Japan	Bolivia	Israel
Belgium	Netherlands	Brazil	Korea, Rep.
Canada	New Zealand	Chile	Malaysia
Denmark	Norway	China	Mexico
Finland	Portugal	Colombia	Peru
France	Spain	Costa Rica	Philippines
Germany	Sweden	Cyprus	Russian Federation
Greece	Switzerland	Egypt	Singapore
Iceland	United Kingdom	Hong Kong, China	Thailand
Ireland	United States	India	Turkey
			Venezuela

Table A2. Summary statistics of 5 years averaged data for 45 countries, 1985-2007

Variable	Obs	Mean	Std. Dev.	Min	Max
Real GDP growth (total)	186	0.159	0.111	-0.078	0.668
TFP growth (average)	186	0.006	0.017	-0.072	0.059
Capital controls	186	0.341	0.350	0	1
d.Reserves to GDP	186	0.006	0.016	-0.029	0.109
Private credit to GDP	186	0.750	0.492	0.109	2.681
(log) terms of trade	186	4.617	0.192	3.845	5.178
Trade openness	186	0.733	0.659	0.134	4.173
Population growth	186	0.012	0.008	-0.004	0.037
Human capital	186	9.128	5.770	0.762	24.370
Institutional quality	186	8.228	2.432	2.972	12
Crisis	186	0.167	0.306	0	1

A.2. IV approach

We further check the robustness of our results by incorporating an instrumental variable for reserves changes. Tong and Wei (2019) proposed an IV for international reserves, which has also been utilized in Choi and Taylor (2022). They construct a predicted level of reserve accumulation via commodity export revenue increases caused by commodity prices increases. If combined with the mandatory surrender condition, a meaningful fraction of increases in commodity export revenue would then be converted to official exchange reserves. In other words, presumably, exogenous commodity price increases would possibly lead to reserves increases. Following previous literature, we incorporate the IV through two-stage least square regression. First, we regress the ratio of reserves to GDP on these predicted values of the reserve increases via commodity export revenue increases, along with year and country fixed effects. Note that the instrumental variable is available from 1990 to 2015.

The result shows a statistically significant coefficient of the IV on reserves. One percentage point increase in predicted commodity export revenue to GDP will increase the reserves to GDP by 0.50 percentage points. The t statistic for the coefficient is 3.70. Then we extract the fitted values of the reserves to GDP and name those as reserves to GDP instrumented. We re-do our baseline regression with the fitted values of reserves to GDP, and check our results.

Table A3 shows the results for real GDP and TFP growth with instrumented reserves to GDP changes. In column (1), for a country with complete capital controls, a rise in reserves to GDP ratio by one percentage point leads to a 6.85 (10.97-4.12) percentage point rise in real GDP growth rate. In Column (2), we use system GMM, however, the result loses its significance slightly. In column (3), for a country with complete capital controls, a rise in reserves to GDP ratio by one percentage point leads to 1.57 (1.92-0.35) percentage point rise in TFP growth rate. Column (4) shows the system GMM results for TFP growth. While the coefficient on the interaction term of CC and instrumented reserves to GDP changes are positive and significant, the specification test and weak IV test do not support the validity of the system GMM results. Overall, we claim that our results are robust with the instrumental variable approach.

Tables A4 and A5 also help address endogeneity by pursuing a more flexible specification for the system GMM by considering not only initial GDP, the terms of trade, and private credit to GDP, but also changes in reserves to GDP and its interaction term with capital controls as endogeneous or predetermined. Here we simply use the lagged values of each endogenous variable as IVs. Table A4 includes real GDP and TFP growth as the dependent variable. Table A5 employs labor productivity growth for each sector. In column (1) of Table A4, the estimated coefficients on the interaction terms of capital control and changes in reserves to GDP are significantly positive. Column (2) implements sub-sample analysis for emerging market countries. Although our *de jure* capital control index is persistent and (exogenously) shaped by policy regulation or legislation, we attempt to consider a possible endogeneity of capital controls for the emerging market sample. Again the results for the emerging market sample in column (2) are consistent with those in column (1). Columns (3) and (4) show the results for TFP growth. The estimated coefficients on the interaction term of capital control and changes in reserves to GDP are positive and significant, which is consistent with the results for real GDP growth. Table A5 shows that most of the sectors are muted in response to reserve accumulation combined with capital controls. We find that labor productivity of the manufacturing sector and personal services sector responds to the capital account policy positively in columns (3) and (6). However, the results in manufacturing are more significant at the 1% level, and better support the validity of instruments than those in personal services. Thus, the results are consistent with those in Table 4.

Table A3. Robustness check: IVs for international reserves (Choi and Taylor, 2022)

	(1)	(2)	(3)	(4)
Dependent variable	RGDP growth		TFP growth	
Method	Panel FE	System GMM	Panel FE	System GMM
Sample	All	All	All	All
Initial value	-0.5693***	-0.0149	-0.1283***	-0.0284
	(0.1111)	(0.0451)	(0.0401)	(0.0376)
Capital controls	-0.0019	0.0770*	0.0063	0.0000
	(0.0610)	(0.0423)	(0.0091)	(0.0100)
Instrumented d.Reserves to GDP	-4.1151	3.3228	-0.3539	-0.0869
	(2.6618)	(3.2390)	(0.4665)	(0.4265)
Capital controls	10.9722*	0.8071	1.9237*	1.8644*
× Inst. d.Reserves to GDP	(6.2263)	(4.8811)	(0.9553)	(1.0636)
Private credit/GDP	0.0167	-0.0072	-0.0009	-0.0069
	(0.0440)	(0.0455)	(0.0061)	(0.0055)
(log) terms of trade	0.0235	0.0299	-0.0115*	-0.0031
	(0.0459)	(0.0816)	(0.0057)	(0.0159)
Trade openness	0.1146	-0.0264	0.0306*	0.0055
	(0.0861)	(0.0601)	(0.0159)	(0.0036)
Population growth	-0.1309	1.9013	-0.9356**	-0.5557**
	(2.8213)	(3.0508)	(0.3746)	(0.2529)
Human capital	0.0061	-0.0024	0.0002	0.0005
	(0.0059)	(0.0028)	(0.0008)	(0.0003)
Institution quality	0.0034	0.0087	0.0026*	0.0001
	(0.0069)	(0.0077)	(0.0015)	(0.0012)
Crisis	-0.1334***	-0.1581***	-0.0118*	-0.0154**
	(0.0368)	(0.0516)	(0.0068)	(0.0067)
Country FE	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes
AR(1) (p-value)		0.018		0.129
AR(2) (p-value)		0.868		0.457
Weak IV (p-value)		0.38/0.03/0.01		0.22/0.12/0.15
Over-id test (p-value)		0.542		0.384
# of instruments		18		22
# of countries	40	40	40	40
Observations	136	136	136	136
R-squared	0.734		0.630	

Notes: Two step system GMM results are reported in columns (2) and (4). Initial GDP, the terms of trade and private credit to GDP are considered endogenous or predetermined. Clustered robust standard errors at the country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%.

Table A4. Robustness check: System GMM considering d.(Res./GDP) as an endogenous variable

	(1)	(2)	(3)	(4)
Dependent variable	RGDP growth		TFP growth	
Sample	Full	Emerging mkt.	Full	Emerging mkt.
Endogenous vars.	Initial GDP, TOT, Prv. credit/GDP, d.(Res./GDP), and d.(Res./GDP)×CC			
Additional endogenous vars.		Capital controls		Capital controls
Initial GDP	-0.0207	0.0143	0.0384	-0.0309
	(0.0335)	(0.0379)	(0.0793)	(0.0378)
Capital controls	0.0302	-0.2187	0.0088	-0.0050
	(0.0505)	(0.1909)	(0.0106)	(0.0234)
d.Reserves to GDP	-0.6654	-1.0854	-0.0865	-0.2204
	(1.7029)	(1.3584)	(0.1476)	(0.2346)
Capital controls	5.6777*	5.3167**	0.5213*	0.7327*
× d.Reserves to GDP	(3.2195)	(2.3596)	(0.2946)	(0.4164)
Private credit/GDP	-0.0816*	-0.0133	-0.0124	-0.0172
	(0.0450)	(0.0887)	(0.0097)	(0.0135)
(log) terms of trade	0.1945	0.4401***	0.0085	-0.0122
	(0.1341)	(0.1418)	(0.0121)	(0.0289)
Trade openness	0.0013	-0.0393	0.0056*	0.0074*
	(0.0241)	(0.0356)	(0.0029)	(0.0042)
Population growth	1.6978	0.7715	-0.7294**	-0.9927***
	(1.8202)	(2.0836)	(0.3263)	(0.2939)
Human capital	-0.0002	0.0008	0.0008**	0.0002
	(0.0017)	(0.0033)	(0.0003)	(0.0004)
Institution quality	0.0220**	0.0267	0.0000	-0.0009
	(0.0100)	(0.0181)	(0.0016)	(0.0029)
Crisis	-0.1079**	-0.0041	-0.0137*	-0.0088
	(0.0525)	(0.0842)	(0.0074)	(0.0085)
Country FE	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes
AR(1) (p-value)	0.006	0.033	0.016	0.025
AR(2) (p-value)	0.283	0.868	0.892	0.878
Weak IV (p-value)	0.07/0.02/0.02/ 0.02/0.00	0.25/0.25/0.01/ 0.06/0.00/0.02	0.14/0.01/0.08/ 0.00/0.03	0.19/0.22/0.01/ 0.08/0.00/0.17
Over-id test (p-value)	0.152	0.889	0.307	0.225
# of instruments	31	22	21	22
# of countries	45	23	45	23
Observations	186	108	186	108

Notes: Two-step system GMM results are reported in columns (1)-(4). Initial GDP, the terms of trade and private credit to GDP, d.(Res./GDP) and its interaction term are considered endogenous or predetermined in columns (1)-(4). In addition, columns (2) and (4) consider capital controls as an endogenous variable. Weak IV test reports Sanderson-Windmeijer multivariate F test of excluded instruments for initial GDP, TOT, Prv. Credit/GDP, d.(Res./GDP), d.(Res./GDP)×CC and CC, respectively. Clustered robust standard errors at the country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%.

Table A5. Sectoral labor productivity growth considering d.(Reserves/GDP) as an endogenous variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable	Sectoral labor productivity growth								
	Agriculture	Mining	Manufacturing	Construction	Business Services	Personal Services	Trade Services	Utilities	Government
Initial GDP	0.0084	0.0125	0.0054	-0.0014	-0.0006	0.0019	-0.0008	0.0100	-0.0048
	(0.0078)	(0.0088)	(0.0043)	(0.0034)	(0.0106)	(0.0061)	(0.0053)	(0.0108)	(0.0056)
Capital controls (CC)	0.0021	-0.0155	-0.0074	0.0283**	0.0211	0.0078	0.0092	-0.0342	0.0264
	(0.0261)	(0.0502)	(0.0188)	(0.0131)	(0.0382)	(0.0217)	(0.0209)	(0.0533)	(0.0286)
d.Reserves to GDP	-0.0611	1.4616	-0.1861	0.2275	-0.3399	-0.9405*	-0.2738	0.9209	-0.9774
	(0.5267)	(1.5625)	(0.3621)	(0.4329)	(0.7394)	(0.5226)	(0.4238)	(0.8349)	(0.8135)
CC × d.Reserves to GDP	0.7608	-0.5902	1.8403***	0.5228	-0.5659	2.0410**	0.6438	-1.4088	1.4235
	(1.4063)	(2.4378)	(0.6654)	(1.5663)	(2.3274)	(0.9120)	(0.9140)	(1.5304)	(1.2380)
Private credit/GDP	-0.0468	0.0282	-0.0045	-0.0174	0.0139	-0.0156	-0.0041	-0.0270	0.0159
	(0.0386)	(0.0500)	(0.0133)	(0.0165)	(0.0372)	(0.0239)	(0.0202)	(0.0426)	(0.0256)
(log) terms of trade (TOT)	0.0437	-0.0291	0.0078	0.0419	0.0464	0.0194	0.0752*	-0.0098	-0.0544
	(0.0313)	(0.0911)	(0.0265)	(0.0319)	(0.0771)	(0.0179)	(0.0405)	(0.0844)	(0.0442)
Trade openness	-0.0028	-0.0088	0.0051	0.0002	0.0073	0.0142***	0.0115	-0.0002	-0.0035
	(0.0073)	(0.0155)	(0.0050)	(0.0104)	(0.0071)	(0.0055)	(0.0085)	(0.0091)	(0.0130)
Population growth	-0.4939	-0.7875	-0.4425	-1.4786**	0.8441	0.7840	-1.2890*	1.2001	0.2909
	(0.6024)	(2.0937)	(0.4764)	(0.5830)	(0.7867)	(0.5840)	(0.7545)	(1.3422)	(0.7373)
Human capital	-0.0236	-0.0242	-0.0194	-0.0455***	-0.0384	-0.0038	-0.0399***	0.0060	-0.0187
	(0.0171)	(0.0272)	(0.0153)	(0.0154)	(0.0388)	(0.0170)	(0.0116)	(0.0301)	(0.0182)
Institution quality	-0.0002	-0.0011	0.0007	-0.0003	0.0004	0.0009	0.0012	-0.0004	-0.0010
	(0.0012)	(0.0022)	(0.0008)	(0.0008)	(0.0026)	(0.0009)	(0.0008)	(0.0017)	(0.0011)
Crisis	0.0041	0.0061	-0.0005	0.0017	-0.0030	0.0003	-0.0020	-0.0016	0.0004
	(0.0040)	(0.0080)	(0.0031)	(0.0034)	(0.0051)	(0.0038)	(0.0033)	(0.0054)	(0.0045)
Country & Period FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)/ AR(2) (p-value)	0.00/0.59	0.00/0.37	0.00/0.63	0.02/0.26	0.02/0.69	0.04/0.98	0.00/0.2	0.00/0.65	0.01/0.26
Weak IV (# of valid instruments, p-val<0.1)	2/5	4/5	4/5	2/5	2/5	2/5	0/5	0/5	5/5
Over-id test (p-value)	0.08	0.21	0.28	0.18	0.23	0.34	0.1	0.448	0.02
# of instruments	21	21	21	21	21	21	21	21	21
# of countries	45	43	45	45	44	39	45	44	37
Observations	180	175	177	180	176	160	180	177	141

Notes: Two-step system GMM results are reported in all columns. Initial GDP, the terms of trade (TOT), private credit to GDP, d.(Res./GDP) and its interaction term are considered endogenous variables. Weak IV test reports Sanderson-Windmeijer multivariate F test of excluded instruments for initial GDP, TOT, Prv.credit/GDP, d.(Res./GDP), and d.(Res./GDP)×CC, respectively. Clustered robust standard errors at the country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%.