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ABSTRACT

We review the growth experience of middle-income countries. Economic factors associated with growth appear to differ between middle income and other countries. The efficiency of the financial system is importantly related to the growth rate in low- and middle-income countries, but appears to matter less as one moves up the income scale. Demographic variables also matter importantly in low-income countries. In middle-income countries, in contrast, measures of the financial system no longer appear to matter as importantly, as if inefficiencies in banking and financial systems are no longer as binding a constraint as at earlier stages of financial development; nor are demographic variables as important as before. At this point, other variables gain a growing role: these include whether the country experiences a banking or currency crisis, the extent of nonforeign direct investment capital inflows, and government debt as a share of gross domestic product.

Keywords: crisis, growth, middle income, total factor productivity

JEL codes: O10, O40, O47

I. INTRODUCTION

Global growth has visibly slowed down since the financial crisis of 2008–2009. Initially, the slowdown was largely confined to the advanced economies where the crisis originated, giving rise to a two-speed world economy of sluggish advanced economies and robust emerging markets. Subsequently, however, growth in emerging markets has also decelerated, further dampening global growth prospects. Slower growth in the advanced economies and the less favorable external environment no doubt played a role in the slower growth of the emerging markets. But a wide range of internal factors may also have contributed to the emerging market slowdown.

In this context, the postcrisis emerging market growth deceleration is giving fresh impetus to the so-called "middle-income trap" debate. The debate is centered on a well-known stylized fact: Many countries made the jump from low income to middle income, but only a handful were able to make the final jump from middle income to high income. A number of structural factors, such as the shift from input-led growth to productivity- and innovation-led growth, make the middle-to-high transition more challenging. The idea of a middle-income trap resonates especially in Asia, which has been transformed by sustained rapid growth from a low-income region to a middle-income region. Of particular interest is the People's Republic of China (PRC), where a tangible decline in the growth rate since the postcrisis period, after decades of world-topping growth that turned the country into the world's second largest economy, is triggering widespread concerns about the middle-income trap. The burning question for the PRC, which is now comfortably middle income, is whether it will follow in the footsteps of Brazil or, more hopefully, in the footsteps of the Republic of Korea.

The literature on the middle-income trap is fundamentally a literature on economic growth in middle-income countries. But much, albeit not all, of that literature leans heavily on anecdotal—that is to say, country- and episode-specific—evidence. (Exceptions include Eichengreen, Park, and Shin 2012; and Pritchett and Summers 2014.) Contributions to that literature consider a limited number of factors or variables. They employ a confusing array of different definitions of what constitutes a middle-income country.

Thus, it is fair to say that this literature and the associated policy debate could both be better informed by empirical facts. In this paper, we seek to impose some structure on this analytical chaos. We adopt the same taxonomy as other studies in this report when defining or identifying middle-income countries. We consider a wide range of factors or definitions designed to encompass the key variables considered in the preceding literature. We look, not only at the significant determinants of the growth of gross domestic product (GDP) per capita, but also at differences in those determinants across the manufacturing and service sectors. And we analyze not just the determinants of the growth of GDP, but also its "growth accounting components," namely capital stock, labor hours, and total factor productivity (TFP).

Our basic findings are that the economic factors associated with per capita income growth do, in fact, differ across countries in different income classes and between middle income and other countries in particular. The critical distinction is between low- and middle-income countries, insofar as we are concerned with how the prospects for growth, and its determinants, change as formerly poor countries experiencing sustained growth graduate to middle-income status. We find that the lending-to-deposit interest rate spread (as a measure of the efficiency of the financial system) is importantly related to the growth rate in low-income countries (in the expected negative direction). The gender ratio (male to female) and working-age population ratio (share of the population that is of working age) are positively associated with growth in low-income countries, confirming the importance of demographics and specifically the demographic dividend (Lee and Mason 2006).

In contrast, among middle-income countries, the lending–deposit rate spread no longer matters as consistently; this measure of the (under)development of the financial system binds even less frequently and operates less powerfully on growth among high-income countries. Our results suggest, then, that inefficiencies in the financial system matter less, relative to other factors, as countries move up the income scale.

Similarly, the gender ratio is no longer as important as before (although the share of working-age population continues to matter), suggesting the diminishing importance of demographic determinants with graduation to middle-income status. At this point, other variables gain a growing role: these include whether the country experiences a banking or currency crisis (which affects growth negatively), the extent of capital inflows excluding foreign direct investment (FDI) (which affects growth negatively), and government debt as a share of GDP (which again affects growth negatively).

We also distinguish the growth of the manufacturing and service sectors on the grounds that the transition from manufacturing to services is a prominent characteristic, and not infrequently a problem for middle-income countries. There is some sign that demographic factors, government spending, the state of the financial system, and the strength of the political system all matter for the growth of the manufacturing sector in middle-income countries, but the determinants of service sector growth rates are harder to pin down. Put another way, there is a number of concrete policy measures that middle-income countries can do to sustain manufacturing sector growth, but promoting faster service sector growth remains a more elusive quest; it may require, in addition, deep institutional and social reform (Rodrik 2012).

Decomposing overall growth into its proximate growth-accounting components, we find weak evidence that countries that successfully graduate from middle- to high-income status maintain higher investment rates, and strong evidence that they succeed in recording higher TFP growth rates.

We also pursue the point about crises further, given the debate about whether crises affect growth negatively as a result of financial retrenchment (as argued by Reinhart and Rogoff 2009), or positively via their cleansing and reform-galvanizing effect and by encouraging additional investment in the precrisis period (as argued by Tornell and Westermann 2005). We find that very recent crises negatively affect growth, but that past crises do not have a long-run effect on growth either positively or negatively.

An interpretation is that demographic structure and banking sector development are key to growth in low-income countries, but with graduation to middle-income status macroeconomic and financial policies, which shape investment, dependence on portfolio capital inflows, the debt burden, and vulnerability to banking and financial crises, come increasingly to the fore. And when it comes to the movement from middle- to high-income status, the always-elusive determinants of TFP growth emerge as a critical factor.

II. DATA

As in other contributions to this project, we define middle-income countries as those with GDP per capita incomes greater than $2,585 but less than or equal to $17,600 in 2011 purchasing power parity (PPP) terms, according to Penn World Tables 9.0 (PWT 9.0).[1]

[1] The cutoff point and definition of middle-income countries were provided by staff of the Asian Development Bank. The latest update of PWT 9.0 is found in Feenstra, Inklaar, and Timmer (2015).

Middle-income countries can be further classified into (i) lower middle income with GDP per capita incomes that are less than or equal to $5,351; and (ii) upper middle income with per capita incomes that are greater than $5,351. The income thresholds were derived by making the World Bank income thresholds based on gross national income (GNI) per capita (Atlas method) terms compatible with the PWT data in 2011 PPP. This was done by using the ratios of the average GNI per capita (Atlas method) to GDP per capita in constant PPP per income group (i.e., low income, lower middle income, upper middle income, and high income) and applying them to the thresholds in GNI per capita (Atlas method) to get the equivalent thresholds in GDP per capita in PPP. But some adjustments were effected to make the United States income as the threshold for classifying high-income countries. Further, the thresholds for lower and upper-middle-income countries were calibrated so that there are about the same number of countries in the lower and upper middle-income categories in 1960.

The dependent variable for most of our analysis, the rate of growth of per capita GDP, is collected from PWT 9.0. Given the source, it follows that per capita GDP is expressed in PPP terms. Sources for the other variables are described in Appendix Table A1.

The resulting sample runs from 1960 to 2014. We divide the sample period into six subsamples: 5 decades (1960–1970, 1971–1980, 1981–1990, 1991–2000, 2001–2010) and a final 4-year period (2011–2014). We simplify by referring to all subsample periods as "decades" in what follows. Note that, in the following empirical analysis, we use one-period start or period-average observation for each country/decade.

We consider 22 variables that in previous analyses, such as Han and Wei (2015), have been shown to bear some relationship to economic growth:

1. Per capita real GDP growth
2. Years of schooling
3. Investment share
4. Working-age population share
5. Working-age population growth
6. Paved roads (kilometer [km] per number of workers)
7. Electricity-generating capacity (kilowatt per number of workers)
8. Railway (km per number of workers)
9. Inflation
10. Domestic credit to private sector (extended by private banks and other financial institutions)
11. Bank credit-to-deposit ratio
12. Lending-to-deposit interest rate spread
13. Banking or currency crisis (number of years with either banking of currency crises divided by 10 for the decade observations and by 4 for the last period [2010–2014])
14. Government debt share (debt-to-GDP ratio)
15. Conflict index
16. Political constraints
17. Accumulated FDI inflows (4 years ahead of each decade)
18. Accumulated non-FDI inflows (4 years ahead of each decade)
19. Trade share (trade [exports + imports] to GDP ratio)
20. Gini index
21. Gender ratio for ages 0–29
22. Government consumption share

Table 1: Summary Statistics: Oil-Producing Countries Included

Income Level	(1) All		(2) Stays Low		(3) Low to Middle or High		(4) Stays Middle		(5) Middle to High		(6) Stays High		(7) Drops	
Variable	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
Per capita real GDP growth (%)	911	1.98	241	1.16	59	4.42	357	2.44	61	3.71	176	1.13	17	−1.98
Years of schooling	726	2.30	190	1.52	46	2.15	279	2.45	51	2.79	151	2.89	9	2.49
Investment share	911	0.21	241	0.14	59	0.19	357	0.22	61	0.28	176	0.27	17	0.25
Working-age population share	875	0.59	241	0.53	58	0.55	343	0.59	57	0.65	161	0.67	15	0.58
Working-age population growth (%)	875	2.04	241	2.57	58	2.52	343	1.93	57	1.08	161	1.62	15	2.28
Paved roads	452	−6.21	163	−7.62	29	−6.73	169	−5.84	26	−4.53	60	−3.92	5	−6.11
Electricity-generating capacity	454	−8.22	165	−10.11	29	−8.61	169	−7.58	26	−6.18	60	−5.52	5	−8.55
Railway (kilometer)	418	−7.66	146	−8.26	28	−7.97	161	−7.56	22	−6.47	57	−6.67	4	−8.20
Inflation	684	0.11	150	0.11	46	0.12	283	0.15	49	0.06	147	0.05	9	0.06
Domestic credit to private sector	608	0.41	129	0.13	39	0.18	253	0.34	47	0.44	130	0.88	10	0.32
Bank credit-to-deposit ratio	735	1.02	188	1.08	47	1.03	293	0.97	52	0.92	145	1.09	10	0.77
Lending-to-deposit interest rate spread	414	0.08	88	0.09	28	0.12	168	0.08	30	0.05	95	0.04	5	0.05
Banking or currency crisis	367	0.23	47	0.24	23	0.24	146	0.26	28	0.18	64	0.24	3	0.37
Government debt share	194	0.40	2	0.15	5	0.18	76	0.33	26	0.37	85	0.49	0	.
Conflicts index	361	7.12	104	7.58	23	6.92	153	7.21	28	6.71	47	6.26	6	6.58
Political constraints	678	0.37	177	0.13	46	0.25	259	0.35	50	0.60	137	0.66	9	0.36
Accumulated FDI inflows	503	0.13	101	0.06	32	0.16	206	0.15	36	0.17	120	0.14	8	0.14
Accumulated non-FDI inflows	462	0.21	92	0.19	30	0.10	187	0.14	31	0.14	115	0.40	7	0.19
Trade share	754	−0.47	190	−0.79	46	−0.51	300	−0.40	55	−0.34	149	−0.25	14	−0.27
Gini index	482	−0.97	94	−0.83	34	−0.84	191	−0.88	43	−1.12	113	−1.23	7	−1.13
Sex ratio	867	1.03	237	1.00	56	1.02	341	1.03	57	1.04	161	1.09	15	1.03
Government consumption share	911	0.20	241	0.20	59	0.21	357	0.20	61	0.18	176	0.17	17	0.27

FDI = foreign direct investment, GDP = gross domestic product.

Notes: Years of schooling, paved roads, electricity-generating capacity, railway, inflation, conflicts index, trade share in GDP, Gini index are log transformed. Since inflation can take a negative number, we calculate $\ln(\pi + \sqrt{\pi^2 + 1})$, where π is inflation rate. We divide the whole sample into (1) all countries, (2) countries that stayed low-income countries during the decade, (3) countries that moved from low- to a higher (middle- or high-) income countries during the decade, (4) countries that stayed middle-income countries during the decade, (5) countries that moved from middle- to high-income countries during the decade, (6) countries that stayed middle-income countries during the decade, and (7) countries that dropped to lower-income countries during the decade.

Sources: Appendix Table A1 for data sources; and authors' calculation.

Note that these 22 variables are identical to the 22 variables considered in Han and Wei (2015) with the following exceptions/modifications:

(i) We did not include global growth rate because we add period dummies (fixed effects) in regressions.
(ii) We include the investment share, which was not considered in Han and Wei.
(iii) We use Gini coefficient instead of the income share of the bottom 40%.

All variables are measured at the initial year except for growth rates that are for the entire decade. We log-transform years of schooling, paved roads, electricity-generating capacity, railway, inflation [$= \ln(\pi + \sqrt{\pi^2 + 1})$], conflicts index, trade share of GDP, and the Gini coefficient.

In the sensitivity analysis that follows, we always include (i) initial income, and (ii) years of schooling, and then add any one variable of interest and add n-tuples for sensitivity analysis in the preceding list. For sensitivity analysis of investment share, for example, we always include investment share itself, the initial income and years of education in the regression, and an n-tuple to check the significance of investment share. We chose n equal to 3 following Levine and Renault (1992).

The classification of low-, middle-, and high-income countries follows Han and Wei (2015), taking into consideration the fact that the base years used in their and our study are different (the base year in PWT 9.0 is 2011). Table 1 presents summary statistics (mean and standard deviation) for these variables for the different country groupings distinguished in the analysis: all observations, countries that began a decade as low-income countries and stayed that way; those that moved from low- to middle- or high-income status during the decade; those that started a decade as middle income and stayed that way, those that moved from middle- to high-income status in a decade; those that started a decade as high income and stayed that way; and finally countries that dropped to lower-income status in the course of a decade. Note that we report summary statistics when oil countries are included (Table 1) and excluded (Appendix Tables A2–A6). In Table 1, the fuller of the two samples, the number of countries in each of these groupings is relatively similar with the exception of the last (countries that drop to lower-income status in the course of the decade). This suggests treating the results for this last category with caution.

III. BASIC RESULTS

In Table 2 through Table 6, we report the regression results (oil-producing countries included) based on the extreme-bounds analysis (EBA) and the entire distribution analysis (EDA) of, inter alia, Sala-i-Martin (1997) for various subsamples (i.e., various individual and combinations of income classes). The results, based on the observations excluding oil countries turn out to be very similar and, hence, not reported. An exception is Table 7, for which we report results both with oil-producing countries included and excluded.

Table 2 starts with all country/decade observations. There, as in the tables that follow, RE denotes panel regressions with random effects, FE panel regressions with fixed effects, and GMM generalized-method-of-moments estimates of dynamic panel regressions. The base Beta is the estimated coefficient of the variable of interest from the regression with the variable and the always-included variables (initial income and years of schooling). The high Beta is then the estimated coefficient of the variable of interest from the regression with the extreme high bound, while the low Beta is the

estimated coefficient of the variable of interest from the regression with the extreme low bound. "Other Variables" refer to the additional variables included beside the variable of interest and the always-included variables when producing the extreme bound coefficients.

Table 2: All Country and Decade Observation

(a) Extreme-bounds analysis

	Variable		Beta	SE	t–stat	Obs	Groups	R^2	Other Variables	NS
RE	Investment share	high	0.122	[0.036]	3.43	96	50	0.34	v11 v13 v15	73
		base	0.043	[0.017]	2.54	726	138	0.20	–	
		low	0.007	[0.028]	0.24	129	80	0.45	v2 v10 v13	
	Work ratio	high	0.41	[0.067]	6.09	234	86	0.41	v3 v4 v15	0
		base	0.166	[0.026]	6.27	720	137	0.25	–	
		low	0.070	[0.044]	1.61	136	36	0.46	v11 v12 v18	
	Banking or currency crisis	high	−0.006	[0.007]	−0.94	95	50	0.49	v2 v13 v16	1
		base	−0.018	[0.004]	−4.34	304	66	0.20	–	
		low	−0.029	[0.006]	−4.73	67	43	0.29	v9 v10 v13	
	Accumulated non-FDI inflows	high	−0.001	[0.006]	−0.17	71	32	0.55	v2 v12 v13	34
		base	−0.01	[0.003]	−3.15	400	127	0.23	–	
		low	−0.035	[0.009]	−3.95	110	62	0.25	v5 v8 v13	
FE	Banking or currency crisis	high	−0.006	[0.005]	−1.30	164	62	0.45	v2 v3 v16	0
		base	−0.017	[0.004]	−4.41	304	66	0.37	–	
		low	−0.026	[0.007]	−3.91	70	44	0.74	v2 v10 v13	
	Accumulated non-FDI inflows	high	0.014	[0.011]	1.22	66	41	0.78	v10 v11 v13	70
		base	−0.012	[0.005]	−2.60	400	127	0.36	–	
		low	−0.048	[0.016]	−3.09	176	90	0.45	v3 v13	
GMM	Banking or currency crisis	high	−0.046	[0.152]	−0.30	92	34		v2 v12 v16	14
		base	−0.271	[0.051]	−5.27	304	66		–	
		low	−0.527	[0.183]	−2.88	96	50		v3 v13 v15	
	Accumulated non-FDI inflows	high	0.169	[0.099]	1.71	89	33		v1 v5 v12	98
		base	−0.09	[0.016]	−5.75	401	127		–	
		low	−0.803	[0.400]	−2.01	95	50		v3 v11 v13	

FDI = foreign direct investment, GDP = gross domestic product, SE = standard error, v1 = investment share, v2 = working-age population share, v3 = working-age population growth, v4 = paved roads (kilometer [km] per number of workers), v5 = electricity-generating capacity (kilowatt per number of workers), v8 = domestic credit to private sector (extended by private banks and other financial institutions), v9 = bank credit-to-deposit ratio, v10 = lending-to-deposit interest rate spread, v11 = banking or currency crisis (number of years with either banking of currency crises divided by 10 for the decade observations and by 4 for the last period [2010–2014]), v12 = government debt share (debt-to-GDP ratio), v13 = conflict index, v15 = accumulated FDI inflows (4 years ahead of each decade), v16 = accumulated non-FDI inflows (4 years ahead of each decade), v18 = Gini index.

Notes: All country/decade observations are used for estimation. RE refers to panel regression with random effects, FE refers to panel regression with fixed effects, and GMM refers to generalized method of moments approach to dynamic panel regression. The base Beta reports the estimated coefficient of variable from the regression with the variable and the always-included variables (initial income and years of schooling) used as regressors. The high Beta reports the extreme high bound of the estimated coefficient of variable of interest; the low Beta reports the extreme low bound of variable of interest. Other variables are the variables that are included besides the variable of interest and the always-included variables, in producing the extreme bound coefficient. We report variables if they are insignificant at the 5% level (one sided) less than 10% of all the sensitivity regressions. NS is the number of regressions where the estimated coefficient is not significant at the 5% level (one sided).

Source: Authors' calculation.

(b) Entire distribution analysis

	Variable	Beta	df	SD	Mean of P-Value	P-Value of the Mean
RE	Investment share	0.052	285.510	0.023	0.027	0.013
	Work ratio	0.212	285.436	0.043	0.001	0.000
	Banking or currency crisis	−0.018	176.734	0.005	0.001	0.000
	Government debt share	−0.010	115.548	0.006	0.112	0.042
	Accumulated non-FDI inflows	−0.010	204.079	0.005	0.017	0.016
FE	Work ratio	0.150	85.714	0.063	0.055	0.010
	Banking or currency crisis	−0.016	54.968	0.005	0.003	0.001
	Accumulated non-FDI inflows	−0.011	80.943	0.005	0.028	0.027
GMM	Banking or currency crisis	−0.270	176.734	0.077	0.005	0.096
	Accumulated non-FDI inflows	−0.170	204.278	0.085	0.032	0.023

FDI = foreign direct investment, FE = panel regression with fixed effects, GMM = generalized method of moments, RE = panel regression with random effects.
Notes: Beta, df, and SD are weighted averages of the estimated coefficients, degrees of freedom, and standard deviations, respectively, using the likelihood values as weights in the sensitivity regressions for each variable reported in Table 2a. Mean of p-value is weighted average of p values; p value of the mean is p-value of the average coefficient using the average standard errors that are calculated from the weighted average of estimated variances. We report variables only when the mean of p-value or p-value of the mean is less than .05.
Sources: Appendix Table A1 for data sources; and authors' calculation.

EBA sometimes imposes the restriction that the relevant coefficients must be statistically significant in every single regression on which the sensitivity analyses are based. In practice, few of our variables satisfy this relatively strict criterion. We, therefore, relaxed the restriction to enable us to report coefficients for a variable if its coefficient is insignificant in less than 10% of all the sensitivity regressions. In other words, when we do 1,159 ($=_{19}\ C_3+_{19}C_2+_{19}C_1$) sensitivity regressions, we report results for a variable if at most 115 cases yield a coefficient that is insignificantly different from zero at the 5% level (one-sided test). In the above equation, 19 is calculated by subtracting 3 (two always-included variable and the variable of interest) from 22 variables listed above.

In the case of EDA, we report coefficients for a variable when the average p-value (weighted by likelihood) or p-value of the average of coefficients (using average standard errors) is less than 0.05.

The results differ a bit, depending on whether random effects, fixed effects, or GMM are used. The EBA points to the importance of banking and currency crises (which depress growth) and accumulated non-FDI (portfolio and "other," in practice mainly bank related) financial capital inflows. In addition, the random effects results suggest a role for the investment share and the share of the population that is of working age. Magnitudes vary; one magnitude to worry about is that on non-FDI inflows, the coefficient of which can switch from positive to negative, depending on whether the high or low value is used.

The EDA results again point to the importance of banking and currency crises as well as accumulated non-FDI inflows. In addition, the random-effects and fixed-effects results suggest a role for the investment share and working-age-population share, as before, and also now to the ratio of government debt to GDP (which enters negatively according to the random-effects results).

Table 3 focuses on all country/decade observations for which the corresponding country belongs to the group of low-income countries in the initial year of the decade. (Note that we, therefore, also include country/decade observations for which the country starts the decade as low income, but ends it as middle or high income.) Here, the EBA results point to the importance of the lending-to-deposit interest rate spread (a measure of the efficiency of the banking system) and the gender ratio,

where the spread has a clear negative impact on growth, while the gender ratio has a positive base effect, but we cannot rule out the possibility of a negative coefficient. The EDA results similarly single out the spread (again with its negative effect) and the gender ratio (again with a positive effect), and in addition point to the positive effect of a relatively large share of the population that is of working age.

Table 3: Countries in the Low-Income Class at the Initial Year

(a) Extreme-bounds analysis

	Variable	Beta		SE	t-stat	Obs	Groups	R^2	Other Variables	NS
RE	Lending-to-deposit interest rate spread	high	−0.025	[0.098]	−0.26	43	25	0.62	v1 v8 v16	62
		base	−0.144	[0.068]	−2.11	72	31	0.42		
		low	−0.514	[0.171]	−3.00	34	20	0.68	v9 v16 v18	
	Sex ratio	high	0.640	[0.239]	2.68	24	11	0.51	v11 v17 v18	114
		base	0.140	[0.053]	2.63	195	53	0.26		
		low	−0.381	[0.219]	−1.74	43	19	0.52	v2 v6 v11	

FDI = foreign direct investment, GDP = gross domestic product, RE = panel regression with random effects, SE = standard error, v1 = investment share, v2 = working-age population share, v6 = railway (km per number of workers), v8 = domestic credit to private sector (extended by private banks and other financial institutions), v9 = bank credit-to-deposit ratio, v11 = banking or currency crisis (number of years with either banking of currency crises divided by 10 for the decade observations and by 4 for the last period [2010–2014]), v16 = accumulated non-FDI inflows (4 years ahead of each decade), v17 = trade share (trade [exports + imports] to GDP ratio), v18 = Gini index.

Notes: Extreme-bounds analysis is done by using observations for which the corresponding country belongs to low-income countries at the initial year of the decade. All country/decade observations are used for estimation. The base Beta reports the estimated coefficient of variable from the regression with the variable and the always-included variables (initial income and years of schooling) used as regressors. The high Beta reports the extreme high bound of the estimated coefficient of variable of interest; the low Beta reports the extreme low bound of variable of interest. Other variables are the variables that are included besides the variable of interest and the always–included variables, in producing the extreme bound coefficient. We report variables if they are insignificant at the 5% level (one sided) less than 10% of all the sensitivity regressions. NS is the number of regressions where the estimated coefficient is not significant at the 5% level (one sided).

Source: Authors' calculation.

(b) Entire distribution analysis

	Variable	Beta	df	SD	Mean of P-Value	P-Value of the Mean
RE	Work ratio	0.271	59.582	0.121	0.064	0.015
	Lending-to-deposit interest rate spread	−0.210	30.683	0.096	0.036	0.018
	Sex ratio	0.258	59.827	0.112	0.040	0.013

RE = panel regression with random effects.

Notes: Entire distribution analysis is done by using observations for which the corresponding country belongs to low-income countries at the initial year of the decade. Beta, df, and SD are weighted averages of the estimated coefficients, degrees of freedom, and standard deviations, respectively, using the likelihood values as weights in the sensitivity regressions for each variable reported in Table 2a. Mean of p-value is weighted average of p values; p value of the mean is p-value of the average coefficient using the average standard errors that are calculated from the weighted average of estimated variances. We report variables only when the mean of p-value or p-value of the mean is less than .05.

Source: Authors' calculation.

The role of the share of the population that is of working age has been emphasized in the literature on the demographic dividend, as noted above. The role of the gender ratio in low- and middle-income countries, while the subject of less attention, has been analyzed by Han and Wei (2015).

"Wei and Zhang (2011a, 2011b, and 2012) and Du and Wei (2013) suggested marriage market competition as a key motivation for savings, labor supply, and work effort—a higher level of wealth relative to one's competitor in the dating/marriage market gives one an edge in attracting the opposite sex. This is true regardless of the sex ratio. But in cases of a higher male/female ratio in the pre-marital age cohort, a certain fraction of males will not be able to find a girlfriend or wife. The drive to create and accumulate physical wealth becomes stronger. This implies that a higher sex ratio (or, more precisely, deviations from a balanced sex ratio in either direction) tends to be associated with a higher rate of economic growth."

Our results are not inconsistent with their conjectures.

Table 4 includes all country/decade observations for which the corresponding country belongs to either low- or middle-income country groupings in the initial year of the decade. (Again, we did not impose any restriction on the final year of the decade). Here, the share of the working-age population continues to matter, while there is also a role for banking and currency crises according to the EDA. Table 5 next does the same for all country/decade observations for which the corresponding country belongs to the group of middle-income countries in the initial year of the decade; the results are entirely consistent with those in Table 4. Finally, Table 6 repeats the exercise for the combined groups of middle- and high-income countries. In this case, there appears to be a role for banking and currency crises, as before, perhaps for the share of the population that is of working age (although this variable registers now in only about half of the cases considered), and accumulated non-FDI-related capital inflows. It makes sense that portfolio capital inflows show up as mattering more for middle- and high-income countries than they do for the low-income grouping, since until recently many low-income countries had maintained relatively strict capital controls and, for other reasons such as political instability and financial underdevelopment, were not on the receiving end of large non-FDI-related flows.

Table 4: Countries in the Low- and Middle-Income Class at the Initial Year

(a) Extreme-bounds analysis

	Variable		Beta	SE	t-stat	Obs	Groups	R^2	Other Variables	NS
RE	Work ratio	high	0.492	[0.070]	7.02	131	71	0.50	v3 v13 v15	29
		base	0.143	[0.031]	4.59	522	120	0.23		
		low	−0.055	[0.163]	−0.34	40	18	0.20	v9 v12 v15	

RE = panel regression with random effects.
v3 = working-age population growth, v9 = bank credit-to-deposit ratio, v12 = government debt share (debt-to-GDP ratio), v13 = conflict index, v15 = accumulated FDI inflows (4 years ahead of each decade).
Notes: Extreme–bounds analysis is done by using observations for which the corresponding country belongs to either low- or middle-income countries at the initial year of the decade. All country/decade observations are used for estimation. The base Beta reports the estimated coefficient of variable from the regression with the variable and the always-included variables (initial income and years of schooling) used as regressors. The high Beta reports the extreme high bound of the estimated coefficient of variable of interest; the low Beta reports the extreme low bound of variable of interest. Other variables are the variables that are included besides the variable of interest and the always-included variables, in producing the extreme bound coefficient. We report variables if they are insignificant at the 5% level (one sided) less than 10% of all the sensitivity regressions. NS is the number of regressions where the estimated coefficient is not significant at the 5% level (one sided).
Source: Authors' calculation.

(b) Entire distribution analysis

	Variable	Beta	df	SD	Mean of P–Value	P–Value of the Mean
RE	Work ratio	0.224	193.357	0.064	0.011	0.000
	Banking or currency crisis	–0.017	111.185	0.009	0.044	0.029
FE	Banking or currency crisis	–0.016	43.022	0.009	0.102	0.043

FE = panel regression with fixed effects, RE = panel regression with random effects.
Notes: Entire distribution analysis is done by using observations for which the corresponding country belongs to either low- or middle-income countries at the initial year of the decade. Beta, df, and SD are weighted averages of the estimated coefficients, degrees of freedom, and standard deviations, respectively, using the likelihood values as weights in the sensitivity regressions for each variable reported in Table 2a. Mean of p-value is weighted average of p values; p value of the mean is p-value of the average coefficient using the average standard errors that are calculated from the weighted average of estimated variances. We report variables only when the mean of p-value or p-value of the mean is less than .05.
Source: Authors' calculation.

Table 5: Countries in the Middle-Income Class at the Initial Year

(a) Extreme-bounds analysis

	Variable		Beta	SE	t-stat	Obs	Groups	R^2	Other Variables	NS
RE	Work ratio	high	0.518	[0.076]	6.79	91	52	0.54	v3 v13 v15	
		base	0.208	[0.032]	6.43	326	103	0.38		29
		low	–0.055	[0.163]	–0.34	40	18	0.20	v9 v12 v15	

FDI = foreign direct investment, GDP = gross domestic product, RE = panel regression with fixed effect, SE = standard error, v3 = working-age population growth, v9 = bank credit-to-deposit ratio, v12 = government debt share (debt-to-GDP ratio), v13 = conflict index, v15 = accumulated FDI inflows (4 years ahead of each decade).
Notes: Extreme-bounds analysis is done by using observations for which the corresponding country belongs to middle-income countries at the initial year of the decade. All country/decade observations are used for estimation. The base Beta reports the estimated coefficient of variable from the regression with the variable and the always-included variables (initial income and years of schooling) used as regressors. The high Beta reports the extreme high bound of the estimated coefficient of variable of interest; the low Beta reports the extreme low bound of variable of interest. Other variables are the variables that are included besides the variable of interest and the always-included variables, in producing the extreme bound coefficient. We report variables if they are insignificant at the 5% level (one sided) less than 10% of all the sensitivity regressions. NS is the number of regressions where the estimated coefficient is not significant at the 5% level (one sided).
Source: Authors' calculation.

(b) Entire distribution analysis

	Variable	Beta	df	SD	Mean of P-Value	P-Value of the Mean
RE	Work ratio	0.253	131.432	0.063	0.009	0.000
	Banking or currency crisis	–0.017	91.450	0.010	0.084	0.041
FE	Banking or currency crisis	–0.018	41.193	0.010	0.115	0.036

FE = panel regression with fixed effects, RE = panel regression with random effects.
Notes: Entire distribution analysis is done by using observations for which the corresponding country belongs to middle-income countries at the initial year of the decade. Beta, df, and SD are weighted averages of the estimated coefficients, degrees of freedom, and standard deviations, respectively, using the likelihood values as weights in the sensitivity regressions for each variable reported in Table 2a. Mean of p-value is weighted average of p values; p value of the mean is p-value of the average coefficient using the average standard errors that are calculated from the weighted average of estimated variances. We report variables only when the mean of p-value or p-value of the mean is less than .05.
Source: Authors' calculation.

In one case (the entire distribution analysis where equations include random effects), there also appears to be an influence of the investment share of GDP. Recall that this variable showed up in the random effects estimates for the entire sample (Table 2). Table 6 is telling us that this effect is largely limited to—that it matters most—for middle- and high-income countries.

Table 7 summarizes Tables 2–6, along with appendix tables, based on observations excluding oil countries) to report variables that pass the EBA and EDA. It turns out that the results, including and excluding oil exporters, are broadly similar, so we discuss results including oil-producing countries. Clearly, the factors associated with growth differ when countries are grouped by per capita income or level of economic development. The critical distinction is between low- and middle-income countries, insofar as we are concerned with how the prospects for growth, and its determinants, change as formerly poor countries experiencing sustained growth graduate to middle-income status. The lending-to-deposit interest rate spread (as a measure of the efficiency of the financial system) is importantly related to the growth rate in low-income countries (in the expected negative direction). The gender ratio (male to female) and working-age population ratio (share of the population that is of working age) are both positively associated with growth, confirming that demographics and specifically, the demographic dividend matter importantly for low-income countries (think India, for example).

Table 6: Countries in the Middle- and High-Income Class at the Initial Year

(a) Extreme-bounds analysis

	Variable	Beta		SE	t-stat	Obs	Groups	R^2	Other Variables	NS
RE	Work ratio	high	0.395	[0.076]	5.22	46	25	0.62	v10 v12 v13	
		base	0.214	[0.027]	7.92	524	120	0.39		0
		low	0.070	[0.044]	1.61	136	36	0.46	v11 v12 v18	
	Banking or currency crisis	high	−0.006	[0.005]	−1.11	143	57	0.40	v2 v4 v16	
		base	−0.019	[0.004]	−4.31	256	64	0.28		1
		low	−0.028	[0.006]	−4.58	42	24	0.26	v10 v12 v13	
	Accumulated non-FDI inflows	high	−0.001	[0.007]	−0.11	87	47	0.51	v2 v11 v13	
		base	−0.008	[0.003]	−2.69	323	110	0.26		78
		low	−0.035	[0.010]	−3.55	91	49	0.30	v5v9 v13	
FE	Banking or currency crisis	high	−0.005	[0.005]	−0.95	149	60	0.46	v2 v3 v16	
		base	−0.018	[0.004]	−4.50	256	64	0.51		2
		low	−0.026	[0.005]	−4.90	42	24	0.8	v10 v12 v13	
	Accumulated non-FDI inflows	high	0.014	[0.011]	1.21	62	37	0.78	v10 v11 v13	
		base	−0.011	[0.005]	−2.40	323	110	0.33		56
		low	−0.057	[0.016]	−3.47	134	69	0.55	v3 v13 v17	
GMM	Banking or currency crisis	high	−0.052	[0.080]	−0.65	127	53		v2 v8 v16	
		base	−0.264	[0.055]	−4.79	235	60			5
		low	−0.404	[0.095]	−4.24	55	36		v8 v10 v13	
	Accumulated non-FDI inflows	high	0.091	[0.151]	0.60	59	36		v10 v11 v13	
		base	−0.064	[0.021]	−3.12	300	103			100
		low	−0.581	[0.204]	−2.84	88	47		v5 v13 v20	

FDI = foreign direct investment, GDP = gross domestic product, v2 = working-age population share, v3 = working-age population growth, v4 = paved roads (kilometer [km] per number of workers), v5 = electricity-generating capacity (kilowatt per number of workers), v8 = domestic credit to private sector (extended by private banks and other financial institutions), v9 = bank credit-to-deposit ratio, v10 = lending-to-deposit interest rate spread, v11 = banking or currency crisis (number of years with either banking of currency crises divided by 10 for the decade observations and by 4 for the last period [2010–2014]), v12 = government debt share (debt-to-GDP ratio), v13 = conflict index, v16 = accumulated non-FDI inflows (4 years ahead of each decade), v17 = trade share (trade [exports + imports] to GDP ratio), v18 = Gini index, v20 = government consumption share.

Notes: Extreme-bounds analysis is done by using observations for which the corresponding country belongs to middle- or high-income countries at the initial year of the decade. All country/decade observations are used for estimation. RE refers to panel regression with random effects, FE refers to panel regression with fixed effects, and GMM refers to generalized method of moments approach to dynamic panel regression. The base Beta reports the estimated coefficient of variable from the regression with the variable and the always-included variables (initial income and years of schooling) used as regressors. The high Beta reports the extreme high bound of the estimated coefficient of variable of interest; the low Beta reports the extreme low bound of variable of interest. Other variables are the variables that are included besides the variable of interest and the always-included variables, in producing the extreme bound coefficient. We report variables if they are insignificant at the 5% level (one sided) less than 10% of all the sensitivity regressions. NS is the number of regressions where the estimated coefficient is not significant at the 5% level (one sided).

Source: Authors' calculation.

(b) Entire distribution analysis

	Variable	Beta	df	SD	Mean of P-Value	P-Value of the Mean
RE	Investment share	0.045	223.585	0.022	0.050	0.022
	Work ratio	0.226	223.511	0.043	0.001	0.000
	Banking or currency crisis	−0.017	157.000	0.005	0.003	0.000
	Government debt share	−0.010	114.795	0.006	0.107	0.038
	Accumulated non-FDI inflows	−0.008	165.669	0.004	0.024	0.029
FE	Work ratio	0.153	72.842	0.065	0.931	0.011
	Banking or currency crisis	−0.016	53.139	0.005	0.005	0.001
	Accumulated non-FDI inflows	−0.011	68.539	0.005	0.029	0.022
GMM	Banking or currency crisis	−0.223	144.570	0.073	0.006	0.001
	Accumulated non-FDI inflows	−0.144	153.844	0.078	0.027	0.034

FDI = foreign direct investment, FE = panel regression with fixed effects, GMM = generalized method of moments, RE = panel regression with random effects.
Notes: Entire distribution analysis is done by using observations for which the corresponding country belongs to middle- or high-income countries at the initial year of the decade. Beta, df, and SD are weighted averages of the estimated coefficients, degrees of freedom, and standard deviations, respectively, using the likelihood values as weights in the sensitivity regressions for each variable reported in Table 2a. Mean of p-value is weighted average of p values; p value of the mean is p-value of the average coefficient using the average standard errors that are calculated from the weighted average of estimated variances. We report variables only when the mean of p-value or p-value of the mean is less than .05.
Source: Authors' calculation.

Among middle-income countries, in contrast, the lending-to-deposit interest rate spread no longer matters as important, as if inefficiencies in the banking and financial system are no longer as binding a constraint as at earlier stages of economic development. This variable is even less consistently related to growth among high- than middle-income countries. (When we include oil exporters, random effects estimates, including the lending-to-deposit interest rate spread, yield negative coefficients in 703 cases and no single case of a positive coefficient. Fixed-effects estimates produce 632 negative coefficients and only 71 positive coefficients, GMM estimates 689 versus 14. We obtain a larger number of positive coefficients for middle-income countries and a still larger number for high-income countries. Regressions substituting private credit relative to GDP as a measure of financial development yield precisely the same pattern, albeit with the opposite sign, consistent with the above. In this case, though, we find relatively more supporting evidence that financial development is important for middle-income countries in the sense that, in some estimations, the number of positive coefficients for middle-income countries is larger than that for low-income countries as well as than that for high-income countries.) Our results, thus, suggest that inefficiencies in the financial system matter less, relative to other factors, as countries move up the income scale.

Similarly, the gender ratio is no longer as important as before, indicating the declining role of demographic determinants with graduation to middle-income status. At this point, other variables gain a growing role: these include whether the country experiences a banking or currency crisis (which affects growth negatively), extent of non-FDI capital inflows (which affects growth negatively), and government debt as a share of GDP (which again affects growth negatively).

Finally, among high-income countries, there is a positive association between investment and growth in a few (but not all) of our estimates.

Table 7: Economic Factors that are Associated with Growth for Different Income Classes

Income	Model		Variables Cris.-						
All	EBA	RE	Inv	WR	Cris (–)	NFDI (–)			
		FE			Cris (–)	NFDI (–)			
		GMM			Cris (–)	NFDI (–)			
	EDA	RE	Inv	WR	Cris (–)	NFDI (–)	GDbt (–)		
		FE		WR	Cris (–)	NFDI (–)			
		GMM			Cris (–)	NFDI (–)			
Low	EBA	RE						LDS (–)	SR
		FE							
		GMM							
	EDA	RE		WR				LDS (–)	SR
		FE							
		GMM							
Low middle	EBA	RE		WR					
		FE							
		GMM							
	EDA	RE		WR	Cris (–)				
		FE			Cris (–)				
		GMM							
Middle	EBA	RE		WR					
		FE							
		GMM							
	EDA	RE		WR	Cris (–)				
		FE			Cris (–)				
		GMM							
Middle or high	EBA	RE		WR	Cris (–)	NFDI (–)			
		FE			Cris (–)	NFDI (–)			
		GMM			Cris (–)	NFDI (–)			
	EDA	RE	Inv	WR	Cris (–)	NFDI (–)	GDbt (–)		
		FE		WR	Cris (–)	NFDI (–)			
		GMM			Cris (–)	NFDI (–)			

EBA = extreme-bounds analysis, EDA = entire distribution analysis, FE = panel regression with fixed effects, GMM = generalized method of moments, RE = panel regression with random effects.
Notes: We summarize variables that pass the criteria of the EBA and/or the EDA in Tables 2–6 that include oil countries. Variables with (–) are negatively associated with growth; variables without (–) are positively associated with growth. Inv is investment rate; WR is working-age population; Cris is the share of years in a period in which the country in question was in banking or currency crisis; NFDI is accumulated non-FDI inflows; GDbt is government debt to GDP ratio; LDS is lending-to-deposit interest rate spread; SR is sex ratio (male/female) for ages 0–29.
Source: Authors' calculation.

IV. GROWTH ACCOUNTING

In Table 8a, we report growth accounting decompositions of aggregate GDP for different income classes of countries. In PWT 9.0, TFP is calculated (for the first time) using labor hours, not number of employees, as the measure of labor input. For countries that do not report labor hours, PWT 9.0 assumes that the average labor hours changed the same way as in the United States over the period. We again categorize countries according to the level of per capita income at the beginning of each decade and whether they moved to another category over the remainder of that period. For present purposes, the

most relevant results are those for middle-income countries that remained middle income, versus middle-income countries that graduated to high-income status.

In Table 8e, we see that countries moving from middle- to high-income status had positive TFP growth in every decade. This includes even the 1970s, which were notorious for their productivity slump. Countries that graduated to high-income status did better in terms of growth of TFP than the full sample of countries (Table 8a) in all decades except the 1960s, when there are only five such countries.

Human capital input also rises relatively strongly, more rapidly than in the previously and still high-income countries (although not more strongly than in the sample as a whole). We interpret this as reflecting relatively heavy investments in education, and the fact that middle-income countries start out behind in terms of educational attainment.

Table 8: Growth Accounting Decomposition of Aggregate Gross Domestic Product for Different Income Classes

(a) All incomes

	Obs	Y	K	L	HC	TFP
1960s	69	5.39%	2.13%	0.78%	0.46%	2.03%
1970s	81	4.77%	2.79%	1.05%	0.52%	0.42%
1980s	92	2.87%	1.69%	1.14%	0.60%	−0.56%
1990s	105	2.65%	1.63%	0.90%	0.50%	−0.37%
2000–2009	114	3.96%	1.92%	0.65%	0.39%	1.01%
2010–2014	113	3.38%	2.03%	0.77%	0.39%	0.19%
Total	**630**	**3.90%**	**2.01%**	**0.86%**	**0.45%**	**0.58%**

Notes: Y, K, L, HC, and TFP are aggregate output, capital, labor, human capital, and total factor productivity, respectively. Growth accounting decomposition is based on cgdpo (aggregate output), ck (capital), emp (number of persons engaged), avh (average annual hours), and labsh (labor income share), collected from Penn World Table 9.0, for countries that stay low-income countries during the corresponding decade.
Sources: Penn World Tables 9.0; and authors' calculation.

(b) Staying low-income countries

	Obs	Y	K	L	HC	TFP
1960s	17	4.71%	1.45%	1.00%	0.34%	1.93%
1970s	15	4.02%	2.03%	1.41%	0.34%	0.24%
1980s	21	2.85%	1.20%	1.55%	0.57%	−0.46%
1990s	20	2.61%	1.21%	1.64%	0.59%	−0.82%
2000–2009	14	5.09%	1.66%	1.33%	0.42%	1.68%
2010–2014	12	5.29%	3.11%	1.73%	0.62%	−0.17%
Total	**99**	**3.91%**	**1.66%**	**1.44%**	**0.48%**	**0.32%**

Notes: Y, K, L, HC, and TFP are aggregate output, capital, labor, human capital, and total factor productivity, respectively. Growth accounting decomposition is based on cgdpo (aggregate output), ck (capital), emp (number of persons engaged), avh (average annual hours), and labsh (labor income share), collected from Penn World Table 9.0, for countries that stay low-income countries during the corresponding decade.
Sources: Penn World Tables 9.0; and authors' calculation.

(c) Moving from low- to middle- and high-income countries

	Obs	Y	K	L	HC	TFP
1960s	6	6.60%	2.46%	1.10%	0.48%	2.56%
1970s	7	6.71%	3.60%	1.59%	0.65%	0.87%
1980s	5	6.23%	3.08%	1.83%	1.07%	0.25%
1990s	3	5.14%	2.61%	1.40%	0.81%	0.32%
2000–2009	9	5.77%	2.34%	0.62%	0.46%	2.35%
2010–2014	3	4.79%	2.45%	1.46%	–0.27%	1.15%
Total	**33**	**6.04%**	**2.78%**	**1.24%**	**0.56%**	**1.46%**

Notes: Growth accounting decomposition is for countries that move from low- to middle- or high-income countries during the corresponding decade. Y, K, L, HC, and TFP are aggregate output, capital, labor, human capital, and total factor productivity, respectively. Growth accounting decomposition is based on cgdpo (aggregate output), ck (capital), emp (number of persons engaged), avh (average annual hours), and labsh (labor income share), collected from Penn World Table 9.0, for countries that stay low-income countries during the corresponding decade.
Sources: Penn World Tables 9.0; and authors' calculation.

(d) Staying middle-income countries

	Obs	Y	K	L	HC	TFP
1960s	40	5.63%	2.42%	0.61%	0.48%	2.12%
1970s	34	5.35%	3.22%	1.09%	0.52%	0.52%
1980s	38	2.75%	1.86%	1.22%	0.68%	–1.02%
1990s	42	2.68%	1.87%	0.92%	0.54%	–0.65%
2000–2009	43	4.17%	2.02%	0.65%	0.43%	1.06%
2010–2014	46	4.04%	2.31%	0.93%	0.48%	0.31%
Total	**243**	**4.07%**	**2.26%**	**0.89%**	**0.52%**	**0.40%**

Notes: Growth accounting decomposition is for countries that stay middle-income countries during the corresponding decade. Y, K, L, HC, and TFP are aggregate output, capital, labor, human capital, and total factor productivity, respectively. Growth accounting decomposition is based on cgdpo (aggregate output), ck (capital), emp (number of persons engaged), avh (average annual hours), and labsh (labor income share), collected from Penn World Table 9.0, for countries that stay low-income countries during the corresponding decade.
Sources: Penn World Tables 9.0; and authors' calculation.

(e) Moving from middle- to high-income countries

	Obs	Y	K	L	HC	TFP
1960s	5	4.51%	1.70%	0.97%	0.68%	1.16%
1970s	14	4.04%	2.32%	0.11%	0.54%	1.07%
1980s	4	5.57%	2.78%	0.72%	0.60%	1.48%
1990s	9	3.83%	2.17%	0.60%	0.46%	0.60%
2000–2009	11	4.22%	1.54%	0.23%	0.40%	2.05%
2010–2014	7	4.44%	2.61%	0.65%	0.35%	0.83%
Total	**50**	**4.27%**	**2.14%**	**0.44%**	**0.49%**	**1.21%**

Notes: Growth accounting decomposition is for countries that move from middle- to high-income countries during the corresponding decade. Notes: Y, K, L, HC, and TFP are aggregate output, capital, labor, human capital, and total factor productivity, respectively. Growth accounting decomposition is based on cgdpo (aggregate output), ck (capital), emp (number of persons engaged), avh (average annual hours), and labsh (labor income share), collected from Penn World Table 9.0, for countries that stay low-income countries during the corresponding decade.
Sources: Penn World Tables 9.0; and authors' calculation.

(f) Staying high-income countries

	Obs	Y	K	L	HC	TFP
1960s	1	4.61%	1.90%	1.07%	0.40%	1.25%
1970s	10	3.67%	2.70%	1.11%	0.62%	−0.77%
1980s	21	2.20%	1.21%	0.62%	0.41%	−0.04%
1990s	28	3.14%	1.48%	0.52%	0.34%	0.80%
2000–2009	36	2.82%	1.92%	0.54%	0.31%	0.06%
2010–2014	45	1.94%	1.33%	0.32%	0.28%	0.01%
Total	**141**	**2.58%**	**1.59%**	**0.52%**	**0.34%**	**0.12%**

Notes: Growth accounting decomposition is for countries that stay high-income countries during the corresponding decade. Y, K, L, HC, and TFP are aggregate output, capital, labor, human capital, and total factor productivity, respectively. Growth accounting decomposition is based on cgdpo (aggregate output), ck (capital), emp (number of persons engaged), avh (average annual hours), and labsh (labor income share), collected from Penn World Table 9.0, for countries that stay low-income countries during the corresponding decade.
Sources: Penn World Tables 9.0; and authors' calculation.

Finally, the physical capital stock grows more rapidly in countries that graduate to high-income status than in the incumbent high-income countries in overall averages (2.14% versus 1.59%). This is particularly true in the 1980s, 1990s, and 2010–2014. Again, not too much should probably be made of the 1960s exception, given the small sample size. From 2000 to 2009 was a period when a number of high-income countries experienced investment booms in the form of construction/real estate bubbles, not something that countries seeking to graduate to high-income status would necessarily want to emulate.

Comparing middle-income countries that graduate (Table 8e) with those that do not (Table 8d) also reveals some interesting contrasts. TFP growth is slower in countries that "remain trapped" in middle-income status. This is consistently true with the exception only of the anomalous 1960s. More surprisingly, the increase in human capital formation is faster in countries that "remain trapped" in middle-income status; this suggests that investment in education is no silver bullet—no guarantee of graduating. The rate of growth of the capital stock is also faster in countries that "remain trapped," although this variable jumps around a lot, investment being volatile, which causes us to hesitate in drawing firm conclusions.

Thus, this growth accounting decomposition suggests that countries graduating to high-income status (countries escaping the middle-income trap) exploit multiple advantages, including relatively fast TFP growth, relatively rapid growth of human capital, and relatively high fixed investment. But rapid growth of the fixed and human capital stocks (brute force investment) are not guarantees of escaping the middle-income trap. While we find evidence for both "perspiration" (investment) and "inspiration" (productivity growth), evidence for the latter is more robust in some cases.

V. SECTORAL COMPARISONS

In this section, we separate aggregate economic growth into the growth of the manufacturing and service sectors, exploring the hypotheses that the two sectors are prone to accelerate and decelerate at different times for different reasons.[2]

[2] Tables reporting economic factor associated with manufacturing and services growth are in the appendix tables.

Results are somewhat sensitive to which of the two procedures is used to identify robust regressors. For manufacturing, EBA points to the importance of the share of government consumption in GDP, which is negatively associated with the subsequent growth of per capita GDP in middle-income countries; this is consistent with worries about the growth effects of bloated public sectors whose spending focuses on transfer payments in particular, something that is a growing problem in a number of middle-income countries. In contrast, neither government consumption nor any of the other candidate variables is identified using EBA when we turn to the service sector.

EDA points to a number of variables as important for the growth of the manufacturing sector in middle-income countries when the relevant relationship is estimated using random effects. These include the share of the population that is of working age, the male-to-female sex ratio, bank credit as a share of bank deposits, and the strength of the political system, which is the political constraint index, where higher values are associated with more robust political systems). All of these variables are positively associated with growth, as well as the Gini coefficient, which is negatively associated with growth. For the service sector, it points to the male-to-female sex ratio and lending-to-deposit interest rate spread as positively associated with growth, which is a bit puzzling.

Overall, it is easier to identify the circumstances under which the growth of the manufacturing sector slows in middle-income countries; those circumstances include unfavorable demographics (a low share of the working-age population, a high ratio of female-to-male workers), a banking sector that provides relatively little credit to producers, a high level of income inequality, and a political system in which the executive is only weakly constrained, along perhaps with a large public sector focused on transfers and other current payments. By comparison, it is harder to characterize the circumstances under which service sector growth slows or stagnates in such economies.[3]

We would note again that the elusive nature of fluctuations in growth, in this case in service sector growth, are not specific to middle-income countries. The same result, namely that there appears to be relatively few significant correlates of changes in service sector growth—perhaps the gender balance, or perhaps none of the variables considered in the present analysis, depending on the technique used to identify robust regressors—applies equally to low-, middle-, and high-income countries, or so it would appear from the appendix tables. Institutional capabilities and human capital are essential for sustained service sector growth (as argued by, inter alia, Rodrik 2012). We could not include these factors as regressors since few reasonable proxies exist for these variables for a wide coverage of countries and a relatively long period.[4]

VI. CRISES AND GROWTH

Tables 3–7 highlighted a possible role for banking and currency crises in affecting growth in middle-income countries generally. To investigate their long-term impact, in Table 9 we add to our earlier growth regressions indicator variables for crises not just in the current decade (that for which the dependent variable is defined) and also the preceding decade. We then estimated three sets of regressions that included all of the significant variables in Appendix Table A1, except for accumulated non-FDI inflows and government debt (for which there are a substantial number of missing

[3] In the case of services, there is a bit of evidence favoring demographic explanations, as in the case of manufacturing, but not much.

[4] While we included years of schooling as a proxy for human capital, the quality of human capital that may play a more important role for service sector growth is not adequately captured by this variable.

observations). In the first set of regressions (the first three columns), the crisis variables—current and lagged crises—were measured as the share of years in a period in which the country in question was in crisis, i.e., the number of years with either banking or currency crises divided by 10 for the decade observations and by 4 for the last period. In the second set of regressions (the second set of three columns), we use a simple dummy variable of whether a country experienced a crisis in a decade. Finally, in the last set of regressions (the last three columns), the regressors include an additional variable based only on the last 3 years of the previous decade (toward the end of the preceding period).

Table 9a shows the results for the full sample. Experiencing a crisis in the current decade has a negative impact on economic growth (the coefficients in question are significantly different from zero at the 99% confidence level), something that will not surprise aficionados of the crisis literature. In contrast, experiencing a crisis in the previous decade, irrespective of how this is measured (average years in crisis or a decade incidence dummy), does not appear to affect growth either positively or negatively, contrary to what has been suggested in some earlier literature. This same finding obtains whether lagged crises are recorded over the entire previous decade or in its final 3 years only. One of the nine coefficients on lagged crises is positive, consistent with the Tornell and Westermann (2005) view. But the safest conclusion appears to be that crises have no long-run impact on growth, either positive or negative.

When we focus exclusively on middle-income countries (Table 9b), basically the same results again come through.

Table 9: The Impact of Crises on Long-Run Growth

(a) All incomes

	(1) Current and Predecade Average Crisis			(2) Current and Predecade Crises Dummies			(3) Average Crisis of Last 3 Years of Predecade		
	RE	FE	GMM	RE	FE	GMM	RE	FE	GMM
Initial income level	−0.014***	−0.024***		−0.015***	−0.025***		−0.016***	−0.031***	
	[0.002]	[0.004]		[0.002]	[0.004]		[0.003]	[0.004]	
Years of schooling	0.013***	0.006	0.296***	0.013***	0.004	0.280**	0.015***	0.003	0.182
	[0.004]	[0.005]	[0.105]	[0.004]	[0.006]	[0.116]	[0.006]	[0.006]	[0.130]
Investment share	0.042**	0.044**	−0.535	0.043**	0.047**	−0.758	0.048**	0.050*	0.075
	[0.017]	[0.019]	[0.510]	[0.018]	[0.020]	[0.572]	[0.023]	[0.025]	[0.556]
Working-age population share	0.145***		0.851	0.151***		0.897	0.143***		0.791
	[0.033]		[0.834]	[0.033]		[1.017]	[0.037]		[1.224]
Average crisis	−0.014***	−0.015***	−0.267***				−0.013***	−0.013***	−0.245***
	[0.004]	[0.004]	[0.056]				[0.004]	[0.004]	[0.062]
Lagged average crisis	0.008**	0.005	−0.040						
	[0.004]	[0.004]	[0.083]						
Lagged per capita real GDP			0.991***			1.035***			0.949***
			[0.096]			[0.116]			[0.092]
Crisis dummy				−0.006***	−0.009***	−0.118***			
				[0.002]	[0.002]	[0.036]			
Lagged crisis dummy				0.002	0.000	−0.050			
				[0.003]	[0.002]	[0.044]			
Average crisis of last 3 years of predecade							0.004	0.003	0.037
							[0.003]	[0.003]	[0.051]
R^2	0.33	0.371		0.3182	0.367		0.314	0.412	
Observations	294	294	294	294	294	294	236	236	236
Countries	66	66	66	66	66	66	66	66	66

FE = panel regression with fixed effects, GDP = gross domestic product, GMM = generalized method of moments, RE = panel regression with random effects.
Notes: Column (1) reports panel regressions with random effects and fixed effects, and dynamic-panel GMM estimation when the current and lagged average crises are used as explanatory variables. Column (2) reports the same regressions when the current and lagged crisis dummies are used. The crisis dummy takes one if any year of the current decade experiences a crisis. Finally, column (3) reports the same three regressions when the average crisis in the last 3 years of the predecade is used. Oil-producing countries are included. * = statistically significant at the 10% level. ** = statistically significant at the 5% level. *** = statistically significant at the 1% level.
Source: Authors' calculation.

(b) Middle-income countries

	(1) Current and Predecade Average Crisis			(2) Current and Predecade Crises Dummies			(3) Average Crisis of Last 3 Years of Predecade		
	RE	FE	GMM	RE	FE	GMM	RE	FE	GMM
Initial income level	−0.017***	−0.036***		−0.017***	−0.034***		−0.019***	−0.036***	
	[0.004]	[0.006]		[0.005]	[0.006]		[0.006]	[0.006]	
Years of schooling	0.006	−0.014	−0.092	0.006	−0.012	−0.143	0.006	−0.013	−0.153
	[0.004]	[0.010]	[0.150]	[0.004]	[0.009]	[0.157]	[0.006]	[0.012]	[0.094]
Investment share	0.040**	0.004	−0.706	0.038**	0.005	−0.501	0.040	0.023	−0.112
	[0.019]	[0.025]	[0.451]	[0.019]	[0.029]	[0.586]	[0.025]	[0.024]	[0.495]
Working-age population share	0.180***	−0.059	1.757*	0.174***	−0.088	2.228**	0.183***	−0.060	2.143**
	[0.038]	[0.058]	[1.010]	[0.041]	[0.054]	[1.013]	[0.050]	[0.071]	[1.092]
Average crisis	−0.013**	−0.006	−0.263***				−0.010	−0.005	−0.240**
	[0.007]	[0.006]	[0.082]				[0.007]	[0.007]	[0.106]
Lagged average crisis	0.003	−0.005	−0.099						
	[0.004]	[0.005]	[0.085]						
Lagged per capita real GDP			0.842***			0.823***			0.827***
			[0.092]			[0.102]			[0.105]
Crisis dummy				−0.008***	−0.008**	−0.082*			
				[0.003]	[0.004]	[0.042]			
Lagged crisis dummy				−0.001	−0.004	−0.041			
				[0.004]	[0.004]	[0.058]			
Average crisis of last 3 years of predecade							0.001	−0.001	0.003
							[0.004]	[0.004]	[0.066]
R^2	0.407	0.525		0.408	0.546		0.366	0.585	
Observations	168	168	168	168	168	168	127	127	127
Countries	59	59	59	59	59	59	54	54	54

FE = panel regression with fixed effects, GDP = gross domestic product, GMM = generalized method of moments, RE = panel regression with random effects.
Notes: The sample includes observations for which the corresponding country belongs to middle–income countries at the initial year of the decade. Oil-producing countries are also included. Column (1) reports panel regressions with random effects and fixed effects, and dynamic-panel GMM estimation when the current and lagged average crises are used as explanatory variables. Column (2) reports the same regressions when the current and lagged crisis dummies are used. The crisis dummy takes one if any year of the current decade experiences a crisis. Finally, column (3) reports the same three regressions when the average crisis in the last 3 years of the predecade is used. Oil-producing countries are included. * = statistically significant at the 10% level.
** = statistically significant at the 5% level. *** = statistically significant at the 1% level.
Source: Authors' calculation.

VII. CONCLUSIONS

In this paper, we have summarized some broad stylized facts about growth in middle-income countries and the determinants—positive and negative—of the potential transition to high-income status.

A key finding is that the economic factors associated with growth differ between middle-income and other countries. One distinction is between low- and middle-income countries. We find that the efficiency of the financial system is more importantly related to the growth rate in low-income countries. We consider a number of different measures of financial development and, consistently, find that this variable matters less, relative to other factors, as one moves up the per capita income scale. At this point, other variables gain a growing role; these include whether the country experiences a banking or currency crisis (which affects current growth negatively), the extent of non-FDI capital inflows (which affects growth negatively), and government debt as a share of GDP (which again affects growth negatively). In addition, we find that demographic variables are especially important for growth in low-income countries, less so in middle-income countries.

A complementary approach to these same questions is growth accounting. Our growth accounting analysis suggests that countries escaping the middle-income trap are characterized by relatively fast TFP growth, relatively rapid growth of human capital, and relatively high fixed investment. But while we find evidence for both "perspiration" (rapid rates of capital formation) and "inspiration" (rapid productivity growth), the evidence for the latter is more robust in some sense.

Distinguishing the manufacturing sector from the service sector turns out to be easier to account for the successful growth of manufacturing in middle-income countries. Success or failure at growing the manufacturing sector appears to hinge on a number of specific labor market variables, financial market variables, and public finance variables (debts and deficits). The growth of the service sector, in contrast, is more difficult to account for (more difficult to associate with these and other variables). We interpret this as suggesting that other, more difficult-to-measure institutional variables are important for sustaining service sector growth. This does not mean that the transition from manufacturing- to services-led growth is impossible for middle-income countries, but success at this transition may not depend on a simple policy formula.

Finally, we confirm that financial crises are bad for growth (not surprisingly) at the time when they occur. But there is little evidence that such crises have a long-lived impact, either positive or negative, over a period of decades. While financial crises are best avoided, sustaining economic growth in middle-income countries and successfully completing the transition to high-income status require policy makers and societies to continue to focus on the fundamental determinants of growth.

Our findings have a number of significant implications for developing Asia in general and the PRC in particular. For one, the positive effect of a relatively young, low-income population on the region's growth in the past may outweigh the adverse effect of an older, middle-income population at present. Returns to further finance sector development may decline now that the region is largely middle income. Combined with our finding that banking crisis and non-FDI capital flows harm growth, these suggest a need for a cautious and gradual approach to financial liberalization. A tradition of fiscal prudence served Asia well in the past, and will serve it well in the future. Above all, our evidence confirms the central importance of TFP growth in Asia's quest to avoid the middle-income trap that has afflicted many other parts of the developing world. That is, to move beyond middle income, the region must shift toward a growth paradigm in which productivity growth takes center stage. Investment in both physical and human capital will also help the region to continue to grow.

APPENDIXES

Table A1: Sources and Definitions of Variables

Variables	Description and Construction	Data Source
Per capita real GDP growth (%)	Log difference of per capita real GDP at constant 2011 national prices	Penn World Table 9.0
Years of schooling	$\ln(\text{Years of Schooling} + \sqrt{\text{Years of Schooling}^2 + 1})$	Barro–Lee Database
Investment share	Share of gross capital formation at current PPPs	Penn World Table 9.0
Working-age population share	Percentage of working-age population, both sexes combined	United Nations
Working-age population growth (%)	Log difference of working-age population, both sexes combined	United Nations
Paved roads	Paved roads in kilometers per thousand workers	Calderón et al. (2014), provided by Han and Wei
Electricity-generating capacity	Electricity generating capacity in gigawatts per thousand workers	Calderón et al. (2014), provided by Han and Wei
Railway (kilometer)	Railways in kilometers per thousand workers	Calderón et al. (2014), provided by Han and Wei
Inflation	$\ln(\text{Inflation} + \sqrt{\text{Inflation}^2 + 1})$, consumer price index (annual %)	World Bank's World Development Indicators
Domestic credit to private sector	Total credit to private sector extended by private banks and other financial institutions	Financial Development and Structure Dataset
Bank credit-to-deposit ratio	Bank credit to bank deposits (%)	World Bank: Global Financial Development Database
Lending-to-deposit interest rate spread	Bank lending deposit spread	World Bank: Global Financial Development Database
Banking or currency crisis	The share of years in a period in which the country in question was in crisis	Carmen Reinhart and Rogoff Database
Government debt share	Total gross central government debt/GDP for all but Italy, the Netherlands, and New Zealand for which we use total gross general government debt/GDP	Carmen Reinhart Database
Conflicts index	Weighted conflict index	Cross-National Time-Series Data Archive
Political constraints	Political constraint indexes "Polcon V"	Henisz (2000, 2002), provided by Han and Wei
Accumulated FDI inflows	Share of gross FDI inflow to GDP in the 4 years ahead of each decade	Bluedorn et al., provided by Han and Wei
Accumulated non-FDI inflows	Share of gross non-FDI inflow to GDP in the 4 years ahead of each decade	Bluedorn et al., provided by Han and Wei
Trade share	% of GDP	World Bank's World Development Indicators
Gini index	In equivalized household disposable income	Standardized World Income Inequality Database 4.0
Sex ratio	Sex ratio (male/female) for ages 0–29	Han and Wei (2016)
Government consumption share	Share of government consumption at current PPPs	Penn World Table 9.0
Human capital	Human capital index	Penn World Table 9.0
Labor share	Share of labor compensation in GDP at current national prices	Penn World Table 9.0
Number of persons engaged	In million	Penn World Table 9.0
Average annual hours	Average annual hours worked by persons engaged	Penn World Table 9.0
Capital stock	Capital stock at constant 2011 national prices ($ million, 2011)	Penn World Table 9.0
Total factor productivity	Constant national prices (2011 = 1)	Penn World Table 9.0

FDI = foreign direct investment, GDP = gross domestic product, PPP = purchasing power parity.
Source: Authors' compilation.

Table A2: All Country and Decade Observations: Oil Countries Excluded

(a) Extreme-bounds analysis

	Variable	Beta		SE	t-stat	Obs	Groups	R^2	Other Variables	NS
RE	Investment share	high	0.122	[0.037]	3.33	92	48	0.336	v11 v13 v15	73
		base	0.043	[0.019]	2.30	647	123	0.167		
		low	0.009	[0.030]	0.31	118	72	0.447	v2 v10 v13	
	Work ratio	high	0.441	[0.056]	7.88	165	83	0.500	v3 v13 v15	0
		base	0.172	[0.030]	5.76	641	122	0.205		
		low	0.066	[0.045]	1.46	132	35	0.472	v11 v12 v18	
	Banking or currency crisis	high	−0.005	[0.004]	−1.15	151	59	0.392	v2 v16 v17	4
		base	−0.016	[0.004]	−3.84	289	63	0.171		
		low	−0.029	[0.006]	−4.60	63	40	0.284	v9 v10 v13	
	Accumulated non-FDI inflows	high	−0.001	[0.006]	−0.24	69	31	0.552	v2 v12 v13	37
		base	−0.015	[0.004]	−3.25	362	115	0.173		
		low	−0.034	[0.011]	−3.21	109	65	0.288	v10 v13 v15	
FE	Banking or currency crisis	high	−0.005	[0.005]	−1.11	156	59	0.448	v2 v3 v16	1
		base	−0.016	[0.004]	−3.94	289	63	0.364		
		low	−0.026	[0.004]	−5.70	55	27	0.574	v12 v13 v15	
	Accumulated non-FDI inflows	high	0.02	[0.011]	1.86	63	39	0.798	v10 v11 v13	93
		base	−0.019	[0.006]	−3.27	362	115	0.322		
		low	−0.044	[0.017]	−2.52	161	81	0.402	v3 v13	
GMM	Banking or currency crisis	high	0.019	[0.178]	0.11	89	33		v2 v12 v16	19
		base	−0.249	[0.049]	−5.08	289	63			
		low	−0.479	[0.108]	−4.41	92	48		v13 v15 v19	
	Accumulated non-FDI inflows	high	0.177	[0.198]	0.90	86	32		v1 v4 v12	78
		base	−0.137	[0.034]	−4.10	363	115			
		low	−0.741	[0.434]	−1.70	91	48		v3 v11 v13	

FDI = foreign direct investment, GDP = gross domestic product, SE = standard error, v1 = investment share, v2 = working-age population share, v3 = working-age population growth, v4 = paved roads (kilometer [km] per number of workers), v9 = bank credit-to-deposit ratio, v10 = lending-to-deposit interest rate spread, v11 = banking or currency crisis (number of years with either banking of currency crises divided by 10 for the decade observations and by 4 for the last period [2010–2014]), v12 = government debt share (debt-to-GDP ratio), v13 = conflict index, v15 = accumulated FDI inflows (4 years ahead of each decade), v16 = accumulated non-FDI inflows (4 years ahead of each decade), v17 = trade share (trade [exports + imports] to GDP ratio), v18 = Gini index, v19 = gender ratio for ages 0–29.

Notes: This is the same table as Table 2a except that the sample does not include observations from oil countries. All country/decade observations are used for estimation. RE refers to panel regression with random effects, FE refers to panel regression with fixed effects, and GMM refers to generalized method of moments approach to dynamic panel regression. The base Beta reports the estimated coefficient of variable from the regression with the variable and the always-included variables (initial income and years of schooling) used as regressors. The high Beta reports the extreme high bound of the estimated coefficient of variable of interest; the low Beta reports the extreme low bound of variable of interest. Other variables are the variables that are included besides the variable of interest and the always-included variables, in producing the extreme bound coefficient. We report variables if they are insignificant at the 5% level (one sided) less than 10% of all the sensitivity regressions. NS is the number of regressions where the estimated coefficient is not significant at the 5% level (one sided).

Source: Authors' calculation.

(b) Entire distribution analysis

	Variable	Beta	df	SD	Mean of P-Value	P-Value of the Mean
RE	Investment share	0.057	263.185	0.025	0.027	0.012
	Work ratio	0.211	263.110	0.046	0.001	0.000
	Banking or currency crisis	−0.016	168.472	0.005	0.004	0.001
	Government debt share	−0.010	112.343	0.006	0.117	0.047
	Accumulated non-FDI inflows	−0.010	188.794	0.005	0.019	0.014
FE	Investment share	0.049	79.007	0.029	0.100	0.045
	Work ratio	0.152	78.985	0.065	0.045	0.011
	Banking or currency crisis	−0.015	52.469	0.005	0.004	0.001
	Accumulated non-FDI inflows	−0.011	74.882	0.005	0.035	0.027
GMM	Banking or currency crisis	−0.249	168.472	0.076	0.007	0.001
	Accumulated non-FDI inflows	−0.165	188.993	0.086	0.030	0.028

FDI = foreign direct investment, FE = panel regression with fixed effects, GMM = generalized method of moments, RE = panel regression with random effects.
Notes: This is the same table as Table 2b except that the sample does not include observations from oil countries. Beta, df, and SD are weighted averages of the estimated coefficients, degrees of freedom, and standard deviations, respectively, using the likelihood values as weights in the sensitivity regressions for each variable reported in Table 2a. Mean of p-value is weighted average of p values; p value of the mean is p-value of the average coefficient using the average standard errors that are calculated from the weighted average of estimated variances. We report variables only when the mean of p-value or p-value of the mean is less than .05.
Source: Authors' calculation.

Table A3: Countries in the Low-Income Class at the Initial Year: Oil Countries Excluded

(a) Extreme-bounds analysis

	Variable		Beta	SE	t-stat	Obs	Groups	R^2	Other Variables	NS
RE	Lending-to-deposit rate spread	high	−0.025	[0.098]	−0.26	43	25	0.616	v1 v8 v16	63
		base	−0.143	[0.068]	−2.10	70	30	0.435		
		low	−0.514	[0.171]	−3.01	34	20	0.679	v9 v16 v18	
	Sex ratio	high	0.64	[0.239]	2.68	24	11	0.512	v11 v17 v18	114
		base	0.141	[0.054]	2.61	191	52	0.259		
		low	−0.381	[0.219]	−1.74	43	19	0.517	v2 v6 v11	

FDI = foreign direct investment, GDP = gross domestic product, RE = panel regression with random effects, SE = standard error, v1 = investment share, v2 = working-age population share, v6 = railway (km per number of workers), v8 = domestic credit to private sector (extended by private banks and other financial institutions), v9 = bank credit-to-deposit ratio, v11 = banking or currency crisis (number of years with either banking of currency crises divided by 10 for the decade observations and by 4 for the last period [2010–2014]), v16 = accumulated non-FDI inflows (4 years ahead of each decade), v17 = trade share (trade [exports + imports] to GDP ratio), v18 = Gini index.
Notes: This is the same table as Table 3a except that the sample does not include observations from oil countries. Extreme-bounds analysis is done by using observations for which the corresponding country belongs to low-income countries at the initial year of the decade. All country/decade observations are used for estimation. The base Beta reports the estimated coefficient of variable from the regression with the variable and the always-included variables (initial income and years of schooling) used as regressors. The high Beta reports the extreme high bound of the estimated coefficient of variable of interest; the low Beta reports the extreme low bound of variable of interest. Other variables are the variables that are included besides the variable of interest and the always–included variables, in producing the extreme bound coefficient. We report variables if they are insignificant at the 5% level (one sided) less than 10% of all the sensitivity regressions. NS is the number of regressions where the estimated coefficient is not significant at the 5% level (one sided).
Source: Authors' calculation.

(b) Entire distribution analysis

	Variable	Beta	df	SD	Mean of P-Value	P-Value of the Mean
RE	Work ratio	0.274	58.731	0.122	0.061	0.014
	Lending-to-deposit rate spread	−0.209	30.206	0.096	0.037	0.019
	Sex ratio	0.258	58.999	0.113	0.041	0.013

RE = panel regression with random effects.
Notes: This is the same table as Table 3b except that the sample does not include observations from oil countries. Entire distribution analysis is done by using observations for which the corresponding country belongs to low-income countries at the initial year of the decade. Beta, df, and SD are weighted averages of the estimated coefficients, degrees of freedom, and standard deviations, respectively, using the likelihood values as weights in the sensitivity regressions for each variable reported in Table 2a. Mean of p-value is weighted average of p values; p value of the mean is p-value of the average coefficient using the average standard errors that are calculated from the weighted average of estimated variances. We report variables only when the mean of p-value or p-value of the mean is less than .05.
Source: Authors' calculation.

Table A4: Countries in the Low- and Middle-Income Class at the Initial Year: Oil Countries Excluded

(a) Extreme-bounds analysis

	Variable	Beta		SE	t-stat	Obs	Groups	R^2	Other Variables	NS
RE	Work ratio	high	0.519	[0.177]	2.93	60	26	0.486	v3 v12 v13	
		base	0.144	[0.033]	4.36	475	110	0.231		38
		low	−0.263	[0.169]	−1.56	23	13	0.003	v6 v10 v12	

GDP = gross domestic product, RE = panel regression with random effects, SE = standard error. v3 = working-age population growth, v6 = railway (km per number of workers), v10 = lending-to-deposit interest rate spread, v12 = government debt share (debt-to-GDP ratio), v13 = conflict index.
Notes: This is the same table as Table 4a except that the sample does not include observations from oil countries. Extreme−bounds analysis is done by using observations for which the corresponding country belongs to either low- or middle-income countries at the initial year of the decade. All country/decade observations are used for estimation. The base Beta reports the estimated coefficient of variable from the regression with the variable and the always-included variables (initial income and years of schooling) used as regressors. The high Beta reports the extreme high bound of the estimated coefficient of variable of interest; the low Beta reports the extreme low bound of variable of interest. Other variables are the variables that are included besides the variable of interest and the always-included variables, in producing the extreme bound coefficient. We report variables if they are insignificant at the 5% level (one sided) less than 10% of all the sensitivity regressions. NS is the number of regressions where the estimated coefficient is not significant at the 5% level (one sided).
Source: Authors' calculation.

(b) Entire distribution analysis

	Variable	Beta	df	SD	Mean of P-Value	P-Value of the Mean
RE	Work ratio	0.221	175.763	0.067	0.016	0.001

RE = panel regression with random effects.
Notes: This is the same table as Table 4b except that the sample does not include observations from oil countries. Entire distribution analysis is done by using observations for which the corresponding country belongs to middle-income countries at the initial year of the decade. Beta, df, and SD are weighted averages of the estimated coefficients, degrees of freedom, and standard deviations, respectively, using the likelihood values as weights in the sensitivity regressions for each variable reported in Table 2a. Mean of p-value is weighted average of p values; p value of the mean is p-value of the average coefficient using the average standard errors that are calculated from the weighted average of estimated variances. We report variables only when the mean of p-value or p-value of the mean is less than .05.
Source: Authors' calculation.

Table A5: Countries in the Middle-Income Class at the Initial Year: Oil Countries Excluded

(a) Extreme-bounds analysis

	Variable		Beta	SE	t-stat	Obs	Groups	R^2	Other Variables	NS
RE	Work ratio	high	0.508	[0.076]	6.68	79	45	0.588	v3 v13 v15	38
		base	0.204	[0.035]	5.83	284	93	0.348		
		low	−0.263	[0.169]	−1.56	23	13	0.003	v6 v10 v12	

FDI = foreign direct investment, GDP = gross domestic product, RE = panel regression with fixed effect, SE = standard error, v3 = working-age population growth, v6 = railway (km per number of workers), v10 = lending-to-deposit interest rate spread, v12 = government debt share (debt-to-GDP ratio), v13 = conflict index, v15 = accumulated FDI inflows (4 years ahead of each decade).
Notes: This is the same table as Table 5a except that the sample does not include observations from oil countries. Extreme-bound analysis is done by using observations for which the corresponding country belongs to middle-income countries at the initial year of the decade. All country/decade observations are used for estimation. The base Beta reports the estimated coefficient of variable from the regression with the variable and the always-included variables (initial income and years of schooling) used as regressors. The high Beta reports the extreme high bound of the estimated coefficient of variable of interest; the low Beta reports the extreme low bound of variable of interest. Other variables are the variables that are included besides the variable of interest and the always-included variables, in producing the extreme bound coefficient. We report variables if they are insignificant at the 5% level (one sided) less than 10% of all the sensitivity regressions. NS is the number of regressions where the estimated coefficient is not significant at the 5% level (one sided).
Source: Authors' calculation.

(b) Entire distribution analysis

	Variable	Beta	df	SD	Mean of P-Value	P-Value of the Mean
RE	Work ratio	0.247	114.651	0.067	0.010	0.000

RE = panel regression with random effects.
Notes: This is the same table as Table 5b except that the sample does not include observations from oil countries. Entire distribution analysis is done by using observations for which the corresponding country belongs to middle-income countries at the initial year of the decade. Beta, df, and SD are weighted averages of the estimated coefficients, degrees of freedom, and standard deviations, respectively, using the likelihood values as weights in the sensitivity regressions for each variable reported in Table 2a. Mean of p-value is weighted average of p values; p value of the mean is p-value of the average coefficient using the average standard errors that are calculated from the weighted average of estimated variances. We report variables only when the mean of p-value or p-value of the mean is less than .05.
Source: Authors' calculation.

Table A6: Countries in the Middle- and High-Income Class at the Initial Year: Oil Countries Excluded

(a) Extreme-bounds analysis

	Variable	Beta		SE	t-stat	Obs	Groups	R^2	Other Variables	NS
RE	Work ratio	high	0.422	[0.063]	6.70	125	64	0.550	v3 v13 v15	0
		base	0.212	[0.030]	7.07	450	105	0.317		
		low	0.066	[0.045]	1.47	132	35	0.472	v11 v12 v18	
	Banking or currency crisis	high	−0.003	[0.005]	−0.60	137	57	0.423	v2 v16 v17	16
		base	−0.016	[0.004]	−4.00	241	61	0.258		
		low	−0.027	[0.007]	−3.86	58	36	0.291	v9 v10 v13	
	Accumulated non-FDI inflows	high	−0.001	[0.006]	−0.17	111	57	0.488	v2 v13 v18	90
		base	−0.013	[0.005]	−2.60	286	98	0.172		
		low	−0.025	[0.009]	−2.78	81	44	0.263	v5 v9 v13	
FE	Banking or currency crisis	high	−0.004	[0.005]	−0.80	141	57	0.452	v2 v3 v16	4
		base	−0.016	[0.004]	−4.00	241	61	0.510		
		low	−0.026	[0.004]	−6.50	55	27	0.574	v12 v13 v15	
	Accumulated non-FDI inflows	high	0.02	[0.011]	1.82	59	35	0.798	v10 v11 v13	59
		base	−0.018	[0.006]	−3.00	286	98	0.269		
		low	−0.052	[0.018]	−2.89	123	63	0.493	v3 v13	
GMM	Banking or currency crisis	high	−0.047	[0.077]	−0.61	122	51		v2 v8 v16	6
		base	−0.236	[0.056]	−4.21	220	57			
		low	−0.406	[0.094]	−4.32	53	34		v8 v10 v13	
	Accumulated non-FDI inflows	high	0.086	[0.239]	0.36	56	34		v10 v11 v13	50
		base	−0.126	[0.021]	−6.00	265	92			
		low	−0.554	[0.287]	−1.93	42	23		v10 v12 v13	

FDI = foreign direct investment, GDP = gross domestic product, SE = standard error, v2 = working-age population share, v3 = working-age population growth, v5 = electricity-generating capacity (kilowatt per number of workers), v8 = domestic credit to private sector (extended by private banks and other financial institutions), v9 = bank credit-to-deposit ratio, v10 = lending-to-deposit interest rate spread, v11 = banking or currency crisis (number of years with either banking of currency crises divided by 10 for the decade observations and by 4 for the last period [2010–2014]), v12 = government debt share (debt-to-GDP ratio), v13 = conflict index, v15 = accumulated FDI inflows (4 years ahead of each decade), v16 = accumulated non-FDI inflows (4 years ahead of each decade), v17 = trade share (trade [exports + imports] to GDP ratio), v18 = Gini index.

Notes: This is the same table as Table 6a except that the sample does not include observations from oil countries. Extreme-bounds analysis is done by using observations for which the corresponding country belongs to middle- or high-income countries at the initial year of the decade. All country/decade observations are used for estimation. RE refers to panel regression with random effects, FE refers to panel regression with fixed effects, and GMM refers to generalized method of moments approach to dynamic panel regression. The base Beta reports the estimated coefficient of variable from the regression with the variable and the always-included variables (initial income and years of schooling) used as regressors. The high Beta reports the extreme high bound of the estimated coefficient of variable of interest; the low Beta reports the extreme low bound of variable of interest. Other variables are the variables that are included besides the variable of interest and the always-included variables, in producing the extreme bound coefficient. We report variables if they are insignificant at the 5% level (one sided) less than 10% of all the sensitivity regressions. NS is the number of regressions where the estimated coefficient is not significant at the 5% level (one sided).

Source: Authors' calculation.

(b) Entire distribution analysis

	Variable	Beta	df	SD	Mean of P-Value	P-Value of the Mean
RE	Investment share	0.051	202.073	0.023	0.041	0.015
	Work ratio	0.217	201.999	0.046	0.001	0.000
	Banking or currency crisis	−0.015	148.738	0.005	0.008	0.001
	Government debt share	−0.010	111.590	0.006	0.112	0.042
	Accumulated non-FDI inflows	−0.009	150.709	0.004	0.025	0.025
FE	Work ratio	0.141	66.154	0.068	0.067	0.020
	Banking or currency crisis	−0.015	50.639	0.005	0.007	0.002
	Accumulated non-FDI inflows	−0.012	62.478	0.005	0.028	0.017
GMM	Banking or currency crisis	−0.202	136.308	0.072	0.008	0.003
	Accumulated non-FDI inflows	−0.146	139.488	0.071	0.018	0.020

FDI = foreign direct investment, FE = panel regression with fixed effects, GMM = generalized method of moments, RE = panel regression with random effects.
Notes: This is the same table as Table 6b except that the sample does not include observations from oil countries. Entire distribution analysis is done by using observations for which the corresponding country belongs to middle- or high-income countries at the initial year of the decade. Beta, df, and SD are weighted averages of the estimated coefficients, degrees of freedom, and standard deviations, respectively, using the likelihood values as weights in the sensitivity regressions for each variable reported in Table 2a. Mean of p-value is weighted average of p values; p value of the mean is p-value of the average coefficient using the average standard errors that are calculated from the weighted average of estimated variances. We report variables only when the mean of p-value or p-value of the mean is less than .05.
Source: Authors' calculation.

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