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Determinants of the Relative Importance of Imports in the Economy: An Empirical Assessment

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Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

This paper examines the impact of various determinants of the share of imports in the economy. Based on data from the World Bank, we apply nonlinear regression to various samples of both developed and developing economies and find that empirical results differ depending on the level of economic development as well as the time period under consideration. Following Esfahani and Dao we specify a statistical model of the share of imports in the GDP as being nonlinear dependent on the log of per capita Gross National Income (GNI), its square, the log of the size of the labor force, its square, the log of the surface area, and its square. We use a total of eleven samples with data for two different years: 2000 and 2014 [1,2]. Statistical results of such empirical examination will answer the question of how the effects of these independent variables vary across different country groups in the same year and also how these effects change over time for the same country classification.

Keywords: Imports; intermediate goods; per capita GNI; labor force; surface area.

JEL Classifications: O12, O15, O40.

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1. INTRODUCTION

While statistically significant correlations between export promotion and output growth have provided empirical support for export-promotion policies as a superior development strategy, one cannot sufficiently emphasize the much required importation of intermediate goods in order to make such strategy possible. In other words, imports are added to the list of input requirements for domestic production. We thus are interested in what factors influence the relative role of imports in the economy. Following Esfahani and Dao we postulate that these factors are: log of per capita gross national income, its square, log of labor force, its square, log of area, and its square [1,2]. For the year 2000, we use five different samples: 1) all countries, 2) low-income developing economies, 3) lower-middle income countries, 4) upper-middle income economies, and 5) high-income countries. For the year 2014 we use six samples: 1) all countries, 2) low-income economies, 3) lower-middle income countries, 4) upper-middle income economies, 5) high income countries, and 6) OECD countries[1].

The current study empirically examines the effect of the above factors on the share of imports in the GDP. Using data from the World Bank for the years 2000 and 2014, we find that empirical results differ depending on the level of economic development as well as the year under consideration.

Statistical results of such empirical examination will answer the question of how the effects of these independent variables vary across different country groups in the same year and also how these effects change over time for the same country classification. This paper is organized as follows. In the next section, a short review of the economic literature on the determinants of imports is presented. This will then be followed by the formulation of a statistical model to be estimated. Theoretical underpinnings for the inclusion of explanatory variables are presented in this section. Statistical results are reported in the subsequent section. A final section gives concluding remarks.

2. A BRIEF REVIEW OF THE LITERATURE

Horton and Wilkinson use simple aggregate models of imports that take explicit consideration of the non-stationarities in the data to show that total imports and endogenous imports in Australia are determined by domestic demand, relative prices, and a time trend [3]. They also find that the relative price of exports is a significant determinant of import growth. Dwyer and Kent attempt to explain the growth of Australia's imports in terms of the increased openness of the economy as proxied by the effective rate of protection [4]. They find that reductions in protection do explain a substantial percentage of the growth in consumer and intermediate goods imports even though this does not seem to be the case for aggregate imports. Egwaikhide uses an econometric model to examine the determinants of imports in Nigeria [5]. He finds that short-run changes in industrial output, foreign exchange availability, and movements in relative prices are responsible for determining the size of raw materials imports. For consumer goods imports, foreign exchange availability is the sole critical determinant. Rogers uses an error correction model to show that in the short run domestic demand and the real effective exchange rate are important determinants of import in Fiji [6]. In the long run, only domestic demand has a significant influence on imports. Using a gravity model, Amponsah and Ofori-Boadu show that devalued currencies of Asian exporters of textile products and liberalization of trade policies have significantly contributed to the increased imports of textile products to the U.S. [7]. Their implications are derived from the abrogation of the WTO Agreement on Textiles and Clothing (ATC). Zhao and Wu use cointegration and VECM techniques and find that growth of industrial production and expansion of transport sectors influence China's oil imports [8]. Aljebrin and Ibrahim empirically estimate the critical import demand determinants for GCC countries (Bahrain, United Arab Emirates, Kuwait, Oman Qatar and Saudi Arabia) by using a panel of annual time series-cross section data (1994-2008) and by applying a Seemingly Unrelated Regression (SUR) model [9]. Their empirical results confirm that, in both long run and short run, there are positive and significant relationships between the demand for imports and real income, private consumption, international reserves and gross capital formation. On the other hand, there are negative and significant relationships between the demand for imports and the relative price of imports to domestic price and government

[1] *A list of countries in each sample is provided in the appendix.*

consumption in the long run, but negative and insignificant relationships in the short run.

3. THE STATISTICAL MODEL

While Chenery and Syrquin use only GNP per capita and labor force (or population) as explanatory variables, we follow Esfahani and Dao and add surface area to capture the effect of country size on the share of imports in the GDP, even though there may be a close association between area and labor force [10,1,2]. However, the justification for including both of these variables is that their impact on reducing the imports-GDP ratio is quite different. On the one hand, countries that have larger labor forces are more likely to have wider markets and greater opportunities for the division of labor and hence rely on a smaller role of imports in the economy. On the other hand, countries with larger areas are more likely to have a greater variety of complementary natural resources and hence do not need to import as much from other countries. In addition, to reduce the transaction costs associated with importing from abroad, various parts of a geographically large country have the tendency of buying from each other rather than buying from other countries.

The statistical model to be estimated, then, would look as follows:

For the year 2000:

$$M/Y2000 = \beta_0 + \beta_1 lnGNI_{pc}00 + \beta_2 (lnGNI_{pc}00)^2 + \beta_3 lnLabor00 + \beta_4 ln(Labor00)^2 + \beta_5 lnArea + \beta_6 (lnArea)^2 + \varepsilon \quad (1)$$

Where

$M/Y2000$ = Share of total imports in GDP, in percent, in 2000.
$lnGNI_{pc}00$= Natural logarithm of per capita gross national income, in 2000.
$lnLabo00r$= Natural logarithm of the size of the labor force, in 2000.
$lnArea$ = Natural logarithm of the surface area, in 2000.

For the year 2014:

$$M/Y2014 = \beta_0 + \beta_1 lnGNI_{pc}14 + \beta_2 (lnGNI_{pc}14)^2 + \beta_3 lnLabor14 + \beta_4 ln(Labor14)^2 + \beta_5 lnArea + \beta_6 (lnArea)^2 + \varepsilon \quad (2)$$

where

$M/Y2014$ =Share of total imports in GDP, in percent, in 2014.
$lnGNI_{pc}14$ = Natural logarithm of per capita gross national income, in 2014.
$lnLabor14$ =Natural logarithm of the size of the labor force, in 2014.
$lnArea$ = Natural logarithm of the surface area, in 2014.

Data for all variables are from the *2016 World Development Indicators* [11]. A glance at these data shows that there are less low-income countries in 2014 compared with 2000. In fact, the number of low-income economies more than halved between those two years. There are also slightly less lower-middle income countries in 2014 as well, suggesting that there was an upward movement of countries on their path of development. The number of upper-middle income countries, on the other hand, surged from 25 to 41 between 2000 and 2014, while that of high-income economies increased from 26 to 45, almost doubled, between the same years.

4. EMPIRICAL RESULTS

Table 1 gives maximum likelihood estimates of regression coefficients in equation *(1)* for a sample of 145 countries. We observe that two explanatory variables, namely log of area and log of labor force, are statistically significant and their coefficient estimates do have the anticipated negative sign. All else equal, a one-percent increase in the land area of a country is expected to lead to a decrease of 11.1 percentage points in the share of imports in the GDP, while this ratio is expected to decrease by 5 percentage points for every one percent increase in the size of the labor force.

Table 1. All countries (2000)

	Coefficients estimates	**t-statistics**
Intercept	62.279	1.239
$lnGNI_{pc}$	8.130	0.626
$(lnGNI_{pc})^2$	-0.577	-0.690
lnArea	-11.139	-2.387**
$(lnArea)^2$	0.614	1.389
lnLabor	-5.015	-1.754*
$(lnLabor)^2$	0.231	0.362

Adjusted R^2 = 0.230
**Significant at the 5 percent level.*
***Significant at the 1 percent level*

Using a backward elimination stepwise method, we arrive at a revised model the results of which are reported in Table 2. We note that, in addition to the log of area and that of the labor force, the

square of the log of area is now barely significant at the 10 percent level and the coefficient estimate of the latter variable has a positive sign, suggesting that the share of imports declines at an increasing rate in countries with larger areas.

Table 2. All countries (2000): Revised model

	Coefficient estimates	t-statistics
Intercept	88.4988	8.0685
lnArea	-11.0220	-2.6471*
(lnArea)^2	0.6331	1.5931**
lnLabor	-4.5839	-2.6552*

Adjusted R^2 = 0.241
**Significant at the 1 percent level.*
***Significant at the 10 percent level*

We repeat the estimation of the model using the share of intermediate goods imports in the GDP rather than total imports and report the result in Table 3[2]. Due to the lack of data on intermediate goods imports, the sample size is reduced to 135 countries. We observe that the results are not as good as those when the share of total imports in GDP is used as the dependent variable. We suspect that this may be due to the fact that the sample includes all countries at different stages of economic development making it difficult to assess the relative importance of intermediate goods imports in the economy.

Table 3. All countries (2000): Intermediate goods imports

	Coefficient estimates	t-statistics
Intercept	25.619	1.935
$lnGNI_{pc}$	-1.908	-0.562
$(lnGNI_{pc})^2$	0.051	0.234
lnArea	-1.386	-1.224
lnLabor	0.103	0.144
(lnLabor)^2	-0.025	-0.157
(lnArea)^2	0.020	0.186

Adjusted R^2 = 0.132

We next examine the effect of the same variables on the share of imports in the GDP using a sample of 54 low-income economies in 2000. Results of this regression are reported in Table 4[3].

[2] *Intermediate imports consist of agricultural raw materials, fuels, ores, and metals.*
[3] *In the interest of saving space, only results of the revised model are reported. Those of the original model are available from the author upon request.*

Table 4. Low-income countries (2000)

	Coefficient estimates	t-statistics
Intercept	-384.131	-1.032
$lnGNI_{pc}00$	143.872	1.117
lnLabor00	-6.582	-3.170
$(lnGNI_{pc}00)^2$	-11.818	-1.068

Adjusted R^2 = 0.140

We note that the log of the labor force is strongly statistically significant and its coefficient estimate does have the anticipated negative sign. Both the log of per capita GNI and its square are not significant even though their coefficient estimates do have their expected sign. We suspect that this is due to the high collinearity between the log of per capita GNI and its square resulting in t-tests being unreliable as indicated by the sample correlation coefficient matrix reported in Table 5.

Table 5. Sample correlation coefficient Matrix: low income (2000)

	$lnGNI_{pc}00$	***lnLabor00***	***$(lnGNI_{pc}00)^2$***
$lnGNI_{pc}00$	1		
lnLabor00	-0.089	1	
	-0.647		
$(lnGNI_{pc}00)^2$	0.999	-0.106	1
	159.305	-0.769	

**Bold t-statistics imply statistical significance at the 10 percent or lower level*

We next re-estimate the model using data from a sample of 38 lower-middle income countries. Results of this regression are reported in Table 6.

Table 6. Lower-middle income economies (2000)

	Coefficient estimates	t-statistics
Intercept	-320.430	-0.727
LnLabor00	-22.801	-3.922*
$LnGNI_{pc}00$	120.311	0.988
LnArea	6.937	0.437
$(LnLabor00)^2$	3.289	2.695*
$(LnGNI_{pc}00)^2$	-9.303	-1.097
$(LnArea)^2$	-0.912	-0.664

Adjusted R^2 = 0.468
**Significant at the 1 percent level*

We observe that the goodness of fit of the model is quite good as indicated by the value of 0.468 of the adjusted coefficient of determination. Only the log of the labor force and its square are statistically significant and the sign of their coefficient estimates suggests a negative impact of the size of the labor force on the share of

imports in the GDP and that this imports-GDP ratio declines at an increasing rate in lower-middle income countries with larger labor forces.

Using a backward elimination stepwise method, we arrive at a revised model the results of which are reported in Table 7. The goodness of fit of the model improves, as attested to by the higher value of 0.485 of the adjusted coefficient of determination. We note that while the log of per capita GNI is not statistically significant, its square is at the 5 percent level. All else equal, a one-percent increase in the size of the labor force is expected to lead to a 24.1 percentage point decline in the share of imports in the GDP.

Table **7. Lower-middle income economies (2000): Revised model**

	Coefficient estimates	t-statistics
Intercept	123.110	4.084
LnLabor00	-24.130	-5.187*
$(LnLabor00)^2$	2.803	2.843*
$(LnGNIpc00)^2$	-0.958	-1.773**

*Adjusted R^2 = 0.485, *Significant at the 1-percent level*
***Significant at the 5 percent level*

We next examine the effect of country size as measured by both the size of the labor force and the surface area and of per capita GNI on the share of imports in the GDP using data from a sample of 25 upper-middle income economies. Results of this regression are reported in Table 8.

Table 8. Upper-middle income economies (2000)

	Coefficient estimates	t-statistics
Intercept	-427.944	-0.543
$lnGNI_{pc}00$	135.482	0.717
lnLabor00	6.521	0.938
lnArea	-3.201	-0.414
$(lnGNI_{pc}00)^2$	-9.039	-0.801
$(lnLabor00)^2$	-1.036	-0.470
$(lnArea)^2$	-0.511	-0.610

Adjusted R^2 = 0.299

The goodness of fit of the model is moderately good as indicated by the value of 0.299 of the adjusted coefficient of determination. We note that none of the explanatory variables is statistically significant. We then apply a backward elimination stepwise procedure and arrive at a revised model the results of which are reported in Table 9 [1,2].

Table 9. Upper-middle income economies (2000): Revised model

	Coefficient estimates	t-statistics
Intercept	149.413	3.549
lnLabor00	8.907	1.556
lnArea	-7.581	-3.046*
$(lnGNI_{pc}00)^2$	-1.011	-1.951**
$(lnLabor00)^2$	-1.998	-1.309

Adjusted R^2 = 0.332
**Significant at the 1 percent level*
***Significant at the 5 percent level*

We observe that the value of the adjusted coefficient of determination increases to 0.332, suggesting a better goodness of fit of the data to the model. Surface area is statistically significant and its coefficient estimate does have the expected negative sign. All else equal, a one percent increase in the surface area is expected to lead to a 7.6 percentage point decrease in the ratio of imports to GDP. As in the case of lower-middle income economies, while the log of per capita GNI is not statistically significant, its square is and the coefficient estimate of this latter variable has a negative sign. While t-tests suggest that the log of labor and its square are not statistically significant, removing them from the model results in a decrease of the explanatory power of the model as measured by the adjusted coefficient of determination. We suspect that this may be due to the severe collinearity that exists among explanatory variables, as indicated by the sample correlation coefficient matrix reported in Table 10.

Table 10. Sample correlation coefficient Matrix: Upper-middle income (2000)

	lnLabor00	$(lnGNI_{pc}00)^2$	lnArea	$(lnLabor00)^2$
lnLabor00	1			
$(lnGNI_{pc}00)^2$	0.047	1		
	0.228			
lnArea	0.726	-0.234	1	
	5.064	-1.153		
$(lnLabor00)^2$	0.881	0.082	0.602	1
	8.950	0.396	**3.619**	

**Bold t-statistics imply statistical significance at the 10 percent or lower level*

As argued first by Esfahani and later by Dao, because of import rationing in most semi-industrialized countries (SICs) or upper-middle income economies, a large part of the contribution of exports to GDP growth is due to their role in increasing the supply of foreign exchange and thus in the importation of intermediate goods, we next re-estimate the model using the share of intermediate goods imports in the GDP as the dependent variable. Results of this regression are reported in Table 11.

Table 11. Upper-middle income (2000): Intermediate goods imports

	Coefficient estimates	t-Statistics
Intercept	-55.871	-0.420
$lnGNI_{pc}00$	18.639	0.584
lnLabor00	1.870	1.591*
lnArea	0.101	0.077
$(lnGNI_{pc}00)^2$	-1.266	-0.663
$(lnLabor00)^2$	-0.088	-0.237
$(lnArea)^2$	-0.237	-1.675*

Adjusted $R^2 = 0.495$
**Significant at the 10 percent level*

As indicated above, the use of the share of intermediate goods imports in the GDP as dependent variable produces better results in terms of the explanatory power of the model since the value of the adjusted coefficient of determination is 0.495, as opposed to 0.299 for the same set of upper-middle income economies when total imports as a percentage of GDP is the regressand. However, only two explanatory variables are barely statistically significant, namely the log of the labor force and the square of the log of area.

Using a backward elimination stepwise method, we arrive at a revised model the results of which are reported in Table 12. Once the statistically nonsignificant explanatory variables are removed from the model, we note that its explanatory power increases to 0.554. In addition, all remaining regressors are strongly statistically significant. As were the cases with the previous samples used, while the log of per capita GNI is not significant, its square is and its coefficient estimate has a negative sign. In the same way, while the log of area is not significant, its square is and its coefficient estimate has a negative sign. The surprising result lies in the observation that the log of the labor force is significant but its coefficient estimate does not have the expected negative sign.

Table 12. Upper-middle income (2000): Intermediate goods imports revised model

	Coefficient estimates	t-statistics
Intercept	22.888	3.713
lnLabor00	1.696	2.983*
$(lnGNI_{pc}00)^2$	-0.163	-2.010**
$(lnArea)^2$	-0.232	-5.441*

Adjusted $R^2 = 0.554$
**Significant at the 1 percent level*
***Significant at the 5 percent level*

This result may be due to the strong collinearity between the log of the labor force and the square of the log of area, as indicated by the sample correlation coefficient matrix reported in Table 13.

Table 13. Sample correlation coefficient matrix: Upper-middle income (2000) Dependent variable: Share of intermediate goods imports in GDP

	lnLabor00	$(lnGNI_{pc}00)^2$	$(lnArea)^2$
lnLabor00	1		
$(lnGNI_{pc}00)^2$	0.0474	1	
	0.228		
$(lnArea)^2$	0.7378	-0.1630	1
	5.241	-0.792	

**Bold t-statistics imply statistical significance at the 10 percent or lower level*

We next re-estimate the model using a sample of 26 high-income countries. Results of this regression are reported in Table 14. We observe that the goodness of fit of the model to the data is by far the best as indicated by the very high value of the adjusted coefficient of determination of 0.779. Four explanatory variables are statistically significant, namely, the log of area, its square, the log of labor, and its square.

The sign of the coefficient estimate for the log of labor variable, however, is positive. All else equal, as the surface area increases by one percent, we would expect the share of imports in the GDP in a high-income economy to decrease by 36 percentage points. We also note that both the log of per capita GNI and its square are statistically not significant. Unlike the results for previous samples, the coefficient estimate of the log of the labor force has a positive sign.

We now apply a backward elimination stepwise procedure and arrive at a revised model the results of which are reported in Table 15. The goodness of fit of the model to the data improves a little as shown by the slightly higher value of

the adjusted coefficient of determination of 0.795. Qualitatively, the results remain the same. We attribute the unexpected result of the positive effect of the log of the labor force on the share of imports in the GDP to the very severe degree of collinearity among all the explanatory variables, as attested to by the sample correlation coefficient matrix reported in Table 16.

Table 14. High income economies (2000)

	Coefficient estimates	t-statistics
Intercept	-1200.071	-0.519
$lnGNI_{pc}00$	266.581	0.576
lnArea	-36.182	-7.502*
lnLabor00	10.959	1.668**
$(lnGNI_{pc}00)^2$	-13.202	-0.570
$(lnArea)^2$	2.548	5.728*
$(lnLabor00)^2$	-2.757	-2.033**

Adjusted R^2 = 0.779
**Significant at the 1 percent level*
***Significant at the 5 percent level*

Table 15. High income economies (2000): revised model

	Coefficient estimates	t-statistics
Intercept	144.201	12.989
lnArea	-36.926	-8.214
lnLabor00	12.481	2.121
$(lnArea)^2$	2.616	6.323
$(lnLabor00)^2$	-3.004	-2.403

Adjusted R^2 = 0.795
**Significant at the 1 percent level*
***Significant at the 5 percent level*

We next re-estimate the model using the share of intermediate goods imports in the GDP as the dependent variable. Results of this regression are reported in Table 17.

We observe that the adjusted coefficient of determination has a slightly lower value of 0.706, compared to 0.779 in the case when the share of total imports in the GDP is used as the dependent variable. Since qualitatively the results are very similar, we proceed to arrive at a revised model by applying a backward elimination stepwise process, the results of which are reported in Table 18. The goodness of fit of the model. is not much improved over that of the original model when all explanatory variables. As in the case when the share of total imports in the GDP is used as the dependent variable, the log of the labor force while statistically significant does not exert a negative impact on the intermediate goods imports-GDP ratio. This again is due to the extremely high degree of collinearity that exists among the explanatory variables. It is worth noting that the impact of surface area is much smaller than when the share of total imports in the GDP is used as the regressand. All else equal, a one percent increase in surface area is expected to lead to a decrease of 5.3 percentage points in the share of intermediate goods imports in the GDP.

Table 19 gives maximum likelihood estimates of regression coefficients in equation *(2)* for a sample of 144 countries. We observe that while the adjusted coefficient of determination is slightly higher than when the sample for the year 2000 was used, none of the explanatory variable is statistically significant. We next proceed to using a backward stepwise elimination procedure and arrive at a revised model, the results of which are reported on Table 20.

We note that the adjusted coefficient of determination increases to 0.266 and two explanatory variables are statistically significant at the 1 percent level. Their coefficient estimates do have the expected negative sign. Holding the area constant, a one-percent increase in the labor force is expected to lead to a decrease of 4.4 percentage points in the share of imports in the GDP. On the other hand, holding the size of the labor force constant, a one-percent increase in the surface area is expected to result in a 3.6 percentage point decrease in the imports-GDP ratio.

Table 16. Sample correlation coefficient Matrix: high income (2000)

	lnArea	***lnLabor00***	***$(lnArea)^2$***	***$(lnLabor00)^2$***
lnArea	1			
lnLabor00	0.684	1		
	4.599			
$(lnArea)^2$	0.951	0.663	1	
	15.027	**4.342**		
$(lnLabor00)^2$	0.607	0.896	0.622	1
	3.742	**9.875**	**3.896**	

**Bold t-statistics imply statistical significance at the 10 percent or lower level*

Table 17. High income economies (2000): Intermediate goods imports

	Coefficient estimates	t-statistics
Intercept	320.108	0.833
$lnGNI_{pc}00$	-58.670	-0.762
lnArea	-5.406	-6.737*
lnLabor00	2.485	2.272**
$(lnArea)^2$	0.372	5.020*
$(lnLabor00)^2$	-0.445	-1.973**
$(lnGNI_{pc}00)^2$	2.859	0.742

Adjusted R^2 = 0.706
**Significant at the 1 percent level*
***Significant at the 5 percent level*

Table 18. High income economies (2000): Intermediate goods imports revised model

	Coefficient estimates	t-statistics
Intercept	35.025	2.339
lnGNIpc00	-1.544	-1.030
lnArea	-5.263	-6.832
lnLabor00	2.260	2.176
$(lnArea)^2$	0.358	5.052
$(lnLabor00)^2$	-0.399	-1.861

Adjusted R^2 = 0.712
**Significant at the 1 percent level*
***Significant at the 5 percent level*

Table 19. All countries (2014)

	Coefficient estimates	t-statistics
Intercept	69.294	1.342
$lnGNI_{pc}14$	2.939	0.238
lnLabor14	-3.205	-1.091
lnArea	-5.143	-1.338
$(lnGNI_{pc}14)^2$	-0.222	-0.308
$(lnLabor14)^2$	-0.273	-0.462
$(lnArea)^2$	0.136	0.371

Adj. R^2 = 0.249

We repeat the regression but use the share of intermediate goods imports in the GDP as the dependent variable. Due to the lack of data for this variable the sample size is reduced to 123 countries. Results of this regression are reported in Table 21.

Table 20. All countries (2014): Revised model

	Coefficient estimates	t-Statistics
Intercept	74.540	14.128
lnLabor14	-4.410	-2.974*
lnArea	-3.625	-3.038*

Adj. R^2 = 0.266
**Significant at the 1 percent level*

The goodness of fit of the model to the data is slightly better than when the share of total imports in the GDP is used as the dependent variable as attested to by the value of 0.261 of the adjusted coefficient of determination. Both the log of area and its square are significant and area does exert a negative impact on the share of intermediate goods imports in the GDP, as postulated. As the area of a country increases by one percent one would expect the share of intermediate goods imports in the GDP to decrease by 4.2 percentage points, ceteris paribus.

Table 21. All countries (2014): Intermediate goods imports

	Coefficient estimates	t-statistics
Intercept	10.124	0.587
$lnGNI_{pc}14$	4.571	1.120
lnLabor14	-0.598	-0.579
lnArea	-4.223	-3.459*
$(lnGNI_{pc}14)^2$	-0.306	-1.294
$(lnLabor14)^2$	0.105	0.524
$(lnArea)^2$	0.230	1.971**

Adjusted R^2 = 0.261
**Significant at the 1 percent level*
Significant at the 5 percent level

Using a backward stepwise elimination procedure, we arrive at a revised model, the results of which are reported in Table 22. The goodness of fit of the model is slightly improved as indicated by the higher value of the adjusted coefficient of determination. We also observe that, in addition to log of area and its square, the log of per capita GNI and its square are now somewhat statistically significant and their coefficient estimates have the correct sign. All else equal, a one-percent increase in per capita GNI is expected to lead to an increase of 5.2 percentage points in the share of intermediate goods imports in the GDP, whereas a one-percent increase in the surface area is expected to result in a reduction of 4.5 percentage points in this share.

Table 22. All countries (2014): Intermediate goods imports (Revised model)

	Coefficient estimates	t-statistics
Intercept	7.993	0.478
$lnGNI_{pc}14$	5.167	1.318***
lnArea	-4.492	-4.033*
$(lnGNI_{pc}14)^2$	-0.342	-1.504***
$(lnArea)^2$	0.249	2.385**

Adjusted R^2 = 0.271
**Significant at the 1 percent level*
***Significant at the 5 percent level*
****Significant at the 10 percent level*

Due to the fact that the sample size of low-income countries in 2014 was much smaller than that in 2000 (25 compared to 54) when the share of total imports in the GDP is used as the dependent variable, we next proceed to estimate the model using data from a sample of 33 lower-middle income countries[4]. Results of this regression are reported in Table 23. The goodness of fit of the model to the data is quite good as indicated by the value of 0.421 of the adjusted coefficient of determination. Only the log of the labor force and its square are statistically significant and their coefficient estimates have their anticipated sign. All else equal, as the size of the labor forces increases by one percent one would expect the share of imports in the GDP to decrease by 14.7 percentage points.

Table 23. Lower-middle income economies (2014)

	Coefficient estimates	t-statistics
Intercept	-530.446	-0.427
$lnGNI_{pc}14$	149.492	0.459
lnLabor14	-14.694	-3.088*
lnArea	24.175	1.196
$(lnGNI_{pc}14)^2$	-10.175	-0.478
$(lnLabor14)^2$	1.743	1.833**
$(lnArea)^2$	-2.563	-1.376

Adjusted R^2 = 0.421
**Significant at the 1 percent level*
***Significant at the 5 percent level*

Using a backward stepwise elimination procedure, we arrive at a revised model, the results of such regression are reported in Table 24. We observe that the value of the adjusted coefficient of determination is slightly higher while the square of the log of area is now significant but the impact of the size of the labor force on the import-GDP ratio remains the same. We also note that the impact of area, while not very strongly statistically significant, is now positive.

Table 24. Lower-middle income economies (2014): revised model

	Coefficient estimates	t-statistics
Intercept	5.092	0.102
lnLabor14	-14.602	-3.129*
lnArea	27.758	1.434
$(lnLabor14)^2$	1.705	1.833**
$(lnArea)^2$	-2.841	-1.591***

Adjusted R^2 = 0.443
**Significant at the 1 percent level.*
***Significant at the 5 percent level.*
****Significant at the 10 percent level.*

We then re-estimate the model for this group of countries using the share of intermediate goods imports in the GDP as the dependent variable and report the results in Table 25. Due to the lack of data, the sample size is reduced to 28. We note that all explanatory variables are statistically significant at the 5 percent or lower level, while two coefficient estimates have the expected sign. This result is not surprising since, as argued by Esfahani [1] and later by Dao [2], lower-middle countries are most likely to suffer from the foreign exchange constraint which in turn affects their importation of intermediate goods used as an input in their production process. We also observe that the magnitude of the impact of the labor force on the share of intermediate goods imports in the GDP is much lower than that when the share of total imports in the GDP is used as the dependent variable. On the other hand, the effect of area is slightly more significant and continues to be positive.

Table 25. Lower-middle income economies (2014): Intermediate goods imports

	Coefficient estimates	t-statistics
Intercept	678.834	1.791
$lnGNI_{pc}14$	-178.579	-1.797**
lnLabor14	-4.890	-3.863*
$(lnLabor14)^2$	0.825	2.988*
$(lnArea)^2$	-0.931	-1.628**
$(lnGNI_{pc}14)^2$	11.542	1.782**
lnArea	10.010	1.678**

Adjusted R^2 = 0.359
**Significant at the 1 percent level*
***Significant at the 5 percent level*

We now re-estimate the model using a sample of 41 upper-middle income countries. Results of this regression are reported in Table 26.

Table 26. Upper-middle income economies (2014)

	Coefficient estimates	t-statistics
Intercept	834.126	0.379
$lnGNI_{pc}14$	-172.890	-0.349
lnLabor14	-7.492	-1.802*
lnArea	1.127	0.143
$(lnGNI_{pc}14)^2$	9.612	0.344
$(lnLabor14)^2$	0.393	0.463
$(lnArea)^2$	-0.238	-0.308

Adjusted R^2 = 0.274
**Significant at the 5 percent level*

[4] *When the share of intermediate goods imports in the GDP is used as the dependent variable, the sample size in 2014 is 19, as opposed to 46 in 2000.*

We observe that only the size of the labor force is significant and its coefficient estimate does have the expected negative sign. We then apply a backward stepwise elimination procedure and arrive at a revised model. Results of this estimation are reported in Table 27. We note that the goodness of fit of the model to the data increases substantially from 0.274 to 0.353, but that only the size of the labor force is strongly significant and its estimate has the expected negative sign. As the labor force increases by one percent we would expect the import-GDP ratio to decrease by 7.2 percentage points.

Table 27. Upper-middle income economies (2014): Revised model

	Coefficient estimate	t-statistic
Intercept	57.451	17.043
lnLabor14	-7.207	-4.778*

Adjusted R^2 = 0.353
**Significant at the 1 percent level*

We now re-estimate the model for the same group of countries while using the share of intermediate goods imports in the GDP as the dependent variable. Due to the lack of data, the sample size is reduced to 33 countries. Results of this regression are reported in Table 28.

The goodness of fit of the model to the data is not very good as indicated by the low value of 0.216 of the adjusted coefficient of determination and no explanatory variable is statistically significant. We then proceed to apply a backward stepwise elimination procedure and arrive at a revised model. Results of this regression are reported in Table 29.

Table 28. Upper-middle income economies (2014): Intermediate goods imports

	Coefficient estimates	t-statistics
Intercept	-62.566	-0.074
$lnGNI_{pc}14$	18.406	0.096
lnLabor14	-2.846	-1.274
lnArea	1.686	0.536
$(lnGNI_{pc}14)^2$	-1.113	-0.103
$(lnLabor14)^2$	0.532	1.336
$(lnArea)^2$	-0.304	-1.001

Adjusted R^2 = 0.216

The value of the adjusted coefficient of determination increases to 0.277, indicating a better fit when statistically nonsignificant explanatory variables are removed from the model. While the log of area is not significant, its square is at the 5 percent level. Labor force does exert a negative influence of the share of intermediate goods imports in the GDP in upper-middle income economies in 2014. All else equal, a one percent increase in the size of the labor force is expected to lead to a 2.4 percentage point decline in the intermediate goods imports-GDP ratio. We also note that due to the severe degree of collinearity among the explanatory variables, t-tests of statistical significance are not reliable. This explains why both the log of the labor force and its square must be included in the model since their exclusion results in a lower value of the adjusted coefficient of determination. The extent of the multicollinearity problem is shown by the sample correlation coefficient matrix reported in Table 30.

Table 29. Upper-middle income economies (2014): Intermediate goods imports: Revised model

	Coefficient estimates	t-statistics
Intercept	16.819	8.027
lnLabor14	-2.446	-1.498
$(lnLabor14)^2$	0.416	1.524
$(lnArea)^2$	-0.146	-2.022*

Adjusted R^2 = 0.277
**Significant at the 5 percent level*

We next estimate the model using data from a sample of 45 high-income countries. Results of this regression are reported in Table 31.

We observe that the goodness of fit of the model to the data is fairly good, as shown by the value of 0.294 of the adjusted coefficient of determination. Three explanatory variables are significant but one coefficient estimate does not have the expected negative sign, namely the log of the labor force. We suspect that this may be due to the collinearity between this variable and the other explanatory variables. All else equal, a one percent increase in the surface area is expected to lead to a decline of 14 percentage points in the ratio of total imports to GDP.

We apply a backward stepwise elimination procedure and arrive at a revised model, the results of which are reported in Table 32.

We observe that the results do not change much from those of the original model, as the log of the labor force continues to have a positive influence on the share of total imports in the GDP. Ceteris paribus, a one percent increase in the surface area is expected to lead to a decrease of 13.4

percentage points in the import-GDP ratio. We report the severe extent of the multicollinearity problem in Table 33.

Table 30. Sample correlation coefficient Matrix: Upper-middle income economies (2014)

	lnLabor14	*(lnArea)^2*	*(lnLabor14)^2*
lnLabor14	1		
(lnArea)^2	0.777	1	
	6.883		
(lnLabor14)^2	0.917	0.735	1
	12.796	**6.036**	

** Bold t-statistics imply statistical significance at the 10 percent or lower level*

Table 31. High income countries (2014)

	Coefficient estimates	**t-statistics**
Intercept	-29.196	-0.023
lnGNI$_{pc}$14	27.793	0.115
lnLabor14	14.956	1.807**
lnArea	-14.061	-2.569*
(lnGNI$_{pc}$14)^2	-1.571	-0.135
(lnLabor14)^2	-3.570	-1.941**
(lnArea)^2	0.660	1.258

Adjusted R^2 = 0.294
**Significant at the 1 percent level.*
***Significant at the 5 percent level.*

Table 32. High income countries (2014): Revised model

	Coefficient estimates	**t-statistics**
Intercept	89.046	7.090
lnLabor14	13.330	1.697**
lnArea	-13.397	-2.521*
lnLabor14sq	-3.280	-1.857**
lnAreasq	0.614	1.204

Adjusted R^2 = 0.318
**Significant at the 1 percent level*
***Significant at the 5 percent level*

We next re-estimate the model using as dependent variable the share of intermediate goods imports in the GDP as the dependent variable. Due to the lack of data, the sample is reduced to 43 countries[5]. Results of this regression are reported in Table 34.

We observe that the goodness of fit of the model to the data is very good as attested to by the high value of 0.514 of the adjusted coefficient of determination. This result implies that the regressors used explain a great deal of cross-country variations in the share of intermediate goods imports in the GDP among high-income countries in 2014. Four explanatory variables are significant but the coefficient estimate of the log of the labor force does not have the anticipated negative sign. As the surface area increases by 1 percent we would expect that the intermediate goods imports to GDP ratio to decrease by 7.6 percentage points, ceteris paribus. We apply the backward stepwise elimination process and find that none of the independent variables can be removed from the model without causing the adjusted coefficient of determination to decrease in value. We suspect that this is due to the severe degree of multicollinearity that exists among the explanatory variables. This explains why t-tests are misleading and cannot be relied upon in order to determine the statistical significance of the explanatory variables. We report this extent of the multicollinearity problem in Table 35.

Finally, since by 2014, the sample size of OECD countries has increased to 30, we decided to estimate the model using this group of economies. Results of such regression are reported in Table 36. These are quite good as shown by the value of 0.459 of the adjusted coefficient of determination. However, only the log area is statistically significant and its coefficient estimate does have the correct negative sign. The log of the labor force is not significant but its coefficient estimate also has the anticipated negative sign. We then apply a backward stepwise elimination procedure and arrive at a revised model. Results of this regression are reported in Table 37.

We observe that the value of the adjusted coefficient of determination has somewhat increased, implying that the removal of two statistically nonsignificant explanatory variables has improved the explanatory power of the model. However, three out of the included variables are barely significant according to t-tests, which we suspect may not be reliable due to the high degree of multicollinearity among the included explanatory variables. The extent of this problem is shown by the sample correlation coefficient matrix reported in Table 38.

Finally, we wish to use the same group of 30 OECD countries to estimate the model while using the share of intermediate goods imports in the GDP as the dependent variable. Results of this regression are reported in Table 39.

[5] *The two countries excluded are Trinidad and Tobago and the United Arab Emirates.*

Table 33. Sample correlation coefficient Matrix: High income countries (2014)

	lnLabor14	lnArea	$(lnArea)^2$	$(lnLabor14)^2$
lnLabor14	1			
lnArea	0.694	1		
	6.326			
$(lnArea)^2$	0.698	0.946	1	
	6.387	**19.105**		
$(lnLabor14)^2$	0.940	0.648	0.690	1
	17.989	**5.586**	**6.256**	

** Bold t-statistics imply statistical significance at the 10 percent or lower level.*

Table 34. High income countries (2014): Intermediate goods imports

	Coefficient estimates	t-statistics
Intercept	-306.702	-0.921
$lnGNI_{pc}14$	67.629	1.053
lnLabor14	4.215	1.862**
lnArea	-7.600	-5.232*
$(lnLabor14)^2$	-0.761	-1.522***
$(lnArea)^2$	0.458	3.297*
$(lnGNI_{pc}14)^2$	-3.374	-1.092

Adjusted R^2 = 0.514
**Significant at the 1 percent level.*
***Significant at the 5 percent level.*
****Significant at the 10 percent level.*

Table 35. Sample correlation coefficient matrix: High income countries (2014): All explanatory variables

	$lnGNI_{pc}14$	lnLabor14	lnArea	$(lnArea)^2$	$(lnLabor14)^2$	$(lnGNI_{pc}14)^2$
$lnGNI_{pc}14$	1					
lnLabor14	0.120	1				
	0.777					
lnArea	-0.039	0.694	1			
	-0.249	**6.177**				
$(lnArea)^2$	-0.010	0.698	0.946	1		
	-0.066	**6.237**	**18.655**			
$(lnLabor14)^2$	0.071	0.940	0.648	0.690	1	
	0.455	**17.566**	**5.455**	**6.109**		
$(lnGNI_{pc}14)^2$	1.000	0.117	-0.036	-0.007	0.0671	1
	245.759	0.754	-0.232	-0.047	0.430	

We note that while the value of the adjusted coefficient of determination is rather good at 35.9 percent, no explanatory variable is statistically significant using the calculated values of the t-statistic. The size of the labor force and the surface area do have a negative impact on the share of intermediate goods imports in the GDP while per capita GNI exerts a positive influence on this share. We next apply a backward stepwise elimination procedure and arrive at a revised model. Results of this regression are reported in Table 40.

The value of the adjusted coefficient of determination improves quite a bit to 0.415 as three explanatory variables are removed the model. The log of area is now strongly significant and its coefficient estimate does have the expected negative sign. All else equal, a 1 percent increase in the surface area is expected to lead to a decline of 1.46 percentage point in share of intermediate goods imports in the GDP. The log of the labor force, its square, and the square of the log of area are not significant as they are removed during the backward stepwise elimination process. On the other hand, both the log of per capita GNI and its square, while not significant based on t-tests, have to be kept in the model in order to increase its explanatory power. We suspect that this is due to the high degree of collinearity among explanatory variables which may have caused the standard errors of the coefficient estimates to be inflated and hence cause t-tests to be misleading and unreliable. The extent of this problem can be illustrated by the sample correlation coefficient matrix reported in Table 41.

Table 36. OECD countries (2014)

	Coefficient estimates	t-statistics
Intercept	1171.904	0.999
lnGNIpc14	-189.311	-0.843
lnArea	-24.427	-1.972*
lnGNIpc14sq	8.638	0.802
lnAreasq	1.468	1.496
lnLabor14	-4.079	-0.486
lnLabor14sq	0.113	0.066

Adjusted R^2 = 0.459
**Significant at the 5 percent level*

Table 37. OECD countries (2014): Revised model

	Coefficient estimates	t-statistics
Intercept	182.966	4.004
lnArea	-22.687	-1.984*
$(lnGNI_{pc}14)^2$	-0.440	-1.584**
$(lnArea)^2$	1.370	1.513**
lnLabor14	-4.556	-1.466**

Adjusted R^2 = 0.487
**Significant at the 5 percent level*
***Significant at the 10 percent level*

Table 38. Sample correlation coefficient matrix: OECD countries (2014)

	lnArea	lnLabor14	$(lnArea)^2$	$(lnGNI_{pc}14)^2$
lnArea	1			
lnLabor14	0.623	1		
	4.210			
$(lnArea)^2$	0.986	0.590	1	
	31.126	**3.866**		
$(lnGNI_{pc}14)^2$	0.251	0.132	0.272	1
	1.372	0.704	1.496	

**Bold t-statistics imply statistical significance at the 10 percent or lower level*

Table 39. OECD Countries (2014): Intermediate Goods Imports

	Coefficient estimates	t-statistics
Intercept	-252.998	-0.987
$lnGNI_{pc}14$	55.415	1.130
lnLabor14	-0.012	-0.007
lnArea	-3.352	-1.239
$(lnGNI_{pc}14)^2$	-2.775	-1.180
$(lnLabor14)^2$	-0.026	-0.069
$(lnArea)^2$	0.162	0.755

Adjusted R^2 = 0.359

Table 40. OECD countries (2014): Intermediate goods imports: Revised model

	Coefficient estimates	t-statistics
Intercept	-257.370	-1.139
$lnGNI_{pc}14$	55.083	1.268
lnArea	-1.464	-3.639*
$(lnGNI_{pc}14)^2$	-2.751	-1.320

Adjusted R^2 = 0.415
**Significant at the 1 percent level*

Table 41. Sample correlation coefficient matrix: OECD countries (2014): Intermediate goods imports

	$lnGNI_{pc}14$	lnArea	$(lnGNI_{pc}14)^2$
$lnGNI_{pc}14$	1		
lnArea	0.250	1	
	1.365		
$(lnGNI_{pc}14)^2$	1.000	0.251	1
	193.438	1.372	

**Bold t-statistics imply statistical significance at the 10 percent or lower level*

5. CONCLUSION

In this paper, we use a semi-logarithmic model and data from several samples of economies to empirically analyze the impact of several explanatory variables on the share of imports in the GDP as well as on the share of intermediate goods imports in the GDP at two different points in time, namely, in 2000 and in 2014. From the statistical results, we are able to draw the following conclusions:

1. For the year 2000, the model does not perform very well when we look at all countries, explaining only a quarter of the cross-economy variations in the share of imports in the GDP. This is quite understandable since we are grouping countries at different stages of the development process. One size does not fit all. When we look at explaining cross-country variations in the ratio of intermediate goods imports to GDP the results are even more dismal. Results are even worse when we examine variations in both the share of imports and that of intermediate goods imports in the GDP across low-income economies.
2. For the year 2000, the model explains quite a bit of variation in cross-country variations in the share of imports in the GDP among thirty-eight lower middle income economies. In fact, almost half of the variation can be explained by the log of the labor force, its square, and the square of the log of per capita GNI, with the labor force exerting a negative influence on this share. When a sample of upper-middle income economies is used, we observe that the explanatory power of the model as measured by the adjusted coefficient of determination is highest at 55.4 percent when the share of intermediate goods imports in the GDP is used as the dependent variable. While the log of the labor force is statistically significant, its coefficient has the unexpected positive sign and we observe that only the square of the log of per capita GNI and that of the log of area are significant. This result is probably due to the strong linear association between the log of the labor force and the square of the log of area.
3. For the year 2000, the results are most astounding when we estimate the model using a sample of 26 high income economies. Close to four-fifths of cross-country variations within this group can be explained by the log of the labor force, its square, the log of area, and its square. We note that the sign of the coefficient estimate for the log of the labor force is unexpectedly positive but it is clear from the sample correlation coefficient matrix that there is very strong linear association among all four explanatory variables. When the share of intermediate goods imports in the GDP is used as the dependent variable, the value of the adjusted coefficient of determination is still very high at 71.2% for the same group of high-income economies. All except one explanatory variables contribute to explaining cross-country variations in this share within this group of economies.
4. For the year 2014, again when all countries are included in the sample, results are not very good, as they are not for the year 2000. Result are significantly better when we examine lower middle-income countries as over 44 percent of variations in the share of imports in the GDP can be explained by the log of area, its square, the log of the labor force, and its square. The difference is that the coefficient estimate of the log of area now does not have the expected negative sign, while that of the log of the labor force does. The possible explanation again for this result lies in the high degree of collinearity among the explanatory variables. Results do not differ much when the share of intermediate goods imports in the GDP is used as the dependent variable. The value of the adjusted coefficient of determination in this case is lower at 36 percent.
5. For the year 2014, results of the regressions using samples of upper middle income economies are not quite as good as those obtained when we look at lower middle-income economies. However, the only significant explanatory variable is the log of the labor force and its coefficient estimate does have the expected negative sign. On the other hand, when we utilize samples of high-income countries, we observe that over half of the variations in the share of intermediate goods imports in the GDP are dependent of all six explanatory variables. The value of the adjusted coefficient of determination is, however, lower at 31.8 percent when the share of total imports in the GDP is used as the dependent variable. Results continue to be quite good when we look at a sample of 30 OECD countries and find that close to half of variations in the imports to GDP ratio within this group can be explained by their dependency on the log of area, its square, the log of the labor force, and the log of per capita GNI. On the other hand, the value of the adjusted coefficient of determination is roughly 42 percent when the share of intermediate goods imports in the GDP is used as the

dependent variable for this group of countries.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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APPENDIX

1a. All Countries (2000): Share of Imports in GDP (n = 145)

Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Bangladesh, Belarus, Belgium, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Central African Republic, Chad, Chile, China, Colombia, Congo Democratic Republic, Republic of Congo, Costa Rica, Cote d'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt Arab Republic, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, Gabon, the Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Honduras, Hungary, India, Indonesia, Iran Islamic Republic, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Republic of Korea, Kuwait, Kyrgyz Republic, Lao PDR, Latvia, Lebanon, Lesotho, Liberia, Lithuania, Macedonia, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Moldova, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sudan, Suriname, Swaziland, Sweden, Switzerland, Syrian Arab Republic, Tajikistan, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen Republic, Zambia, and Zimbabwe.

Data on intermediate goods imports are not available for the following countries: Angola, Bosnia and Herzegovina, Chad, Congo Democratic Republic, Republic of Congo, Equatorial Guinea, Guinea-Bissau, Lao PDR, Liberia, and Uzbekistan.

1b. Low-Income Countries (2000): Share of Imports in GDP (n = 54)

Angola, Armenia, Azerbaijan, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Congo Democratic Republic, Republic of Congo, Cote d'Ivoire, Eritrea, the Gambia, Georgia, Ghana, Guinea, Guinea-Bissau, India, Indonesia, Kenya, Kyrgyz Republic, Lao PDR, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Moldova, Mongolia, Mozambique, Nepal, Nicaragua, Niger, Pakistan, Rwanda, Senegal, Sierra Leone, Sudan, Tajikistan, Tanzania, Togo, Turkmenistan, Uganda, Ukraine, Uzbekistan, Vietnam, Yemen Republic, Zambia, and Zimbabwe.

Data on intermediate goods imports are not available for the following countries: Angola, Chad, Congo Democratic Republic, Republic of Congo, Guinea-Bissau, Lao PDR, Liberia, and Uzbekistan.

1c. Lower-Middle-Income Countries (2000): Share of Imports in GDP (n = 38)

Albania, Algeria, Belarus, Bolivia, Bosnia and Herzegovina, Bulgaria, China, Colombia, Costa Rica, Dominican Republic, Ecuador, Egypt Arab Republic, El Salvador, Equatorial Guinea, Guatemala, Guyana, Honduras, Iran Islamic Republic, Jamaica, Jordan, Kazakhstan, Latvia, Lithuania, Macedonia, Morocco, Namibia, Nigeria, Papua New Guinea, Peru, Philippines, Romania, Russian Federation, Sri Lanka, Swaziland, Syrian Arab Republic, Thailand, Tunisia, and Turkey.

Data on intermediate goods imports are not available for the following countries: Bosnia and Herzegovina and Equatorial Guinea.

1d. Upper-Middle-Income Countries (2000): Share of Imports in GDP (n = 25)

Argentina, Bahrain, Botswana, Brazil, Chile, Croatia, Czech Republic, Estonia, Gabon, Hungary, Republic of Korea, Lebanon, Malaysia, Mauritius, Mexico, Oman, Panama, Paraguay, Poland, Saudi Arabia, Slovak Republic, South Africa, Trinidad and Tobago, Uruguay, and Venezuela.

1e. High Income Countries (2000): Share of Imports in GDP (n = 26)

Australia, Austria, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Kuwait, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovenia, Spain, Sweden, Switzerland, United Kingdom, and United States.

2a. All Countries (2014): Share of Imports in GDP (n = 144)

Afghanistan, Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Bangladesh, Belarus, Belgium, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Central African Republic, Chad, Chile, China, Colombia, Congo Democratic Republic, Republic of Congo, Costa Rica, Cote d'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt Arab Republic, El Salvador, Equatorial Guinea, Estonia, Ethiopia, Finland, France, Gabon, the Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Iran Islamic Republic, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Republic of Korea, Kuwait, Kyrgyz Republic, Lao PDR, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Macedonia, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Serbia, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sudan, Sweden, Switzerland, Tajikistan, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela, Vietnam, Zambia, and Zimbabwe.

Data on intermediate goods imports are not available for the following countries: Afghanistan, Bangladesh, Chad, Congo Democratic Republic, Equatorial Guinea, Gabon, Guinea-Bissau, Haiti, Iran Islamic Republic, Iraq, Lao PDR, Liberia, Libya, Montenegro, Serbia, Sudan, Tajikistan, Trinidad and Tobago, Turkmenistan, United Arab Emirates, and Uzbekistan.

2b. Lower-Middle-Income Countries (2014): Share of Imports in GDP (n = 33)

Armenia, Bangladesh, Bhutan, Bolivia, Cameroon, Republic of Congo, Cote d'Ivoire, Egypt Arab Republic, El Salvador, Ghana, Guatemala, Guyana, Honduras, India, Indonesia, Kenya, Kyrgyz Republic, Lao PDR, Lesotho, Mauritania, Moldova, Morocco, Nicaragua, Nigeria, Pakistan, Philippines, Senegal, Sudan, Tajikistan, Ukraine, Uzbekistan, Vietnam, and Zambia.

2c. Upper-Middle-Income Countries (2014): Share of Imports in GDP (n = 41)

Albania, Algeria, Azerbaijan, Belarus, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, China, Colombia, Costa Rica, Dominican Republic, Ecuador, Equatorial Guinea, Gabon, Georgia, Iran Islamic Republic, Iraq, Jamaica, Jordan, Kazakhstan, Lebanon, Libya, Macedonia, Malaysia, Mauritius, Mexico, Mongolia, Montenegro, Namibia, Panama, Paraguay, Peru, Romania, Serbia, South Africa, Thailand, Tunisia, Turkey, Turkmenistan, and Venezuela.

2d. High Income Countries (2014): Share of Imports in GDP (n = 45)

Argentina, Australia, Austria, Bahrain, Belgium, Canada, Chile, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Republic of Korea, Kuwait, Latvia, Lithuania, Netherlands, New Zealand, Norway, Oman, Poland, Portugal, Qatar, Russian Federation, Saudi Arabia, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Trinidad and Tobago, United Arab Emirates, United Kingdom, United States, and Uruguay.

2e. OECD Countries (2014): Share of Imports in GDP (n = 30)

Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Republic of Korea, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom, and United States.

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