A STRUCTURAL DECOMPOSITION OF IMPORTS IN ARGENTINA: THE ROLE OF AUTONOMOUS DEMAND, INCOME DISTRIBUTION, AND PRODUCTIVE INTEGRATION (1953-2018)[1]

Matías Torchinsky Landau (UNSAM — CONICET)

Abstract

The lack of foreign currency can be one of the most significant constraints on growth for a small open economy. We study imports' growth, the main source of demand for foreign currency, by applyare represented ing a novel structural decomposition analysis to Argentina's input-output matrices based on a Sraffian supermultiplier growth model for the period 1953-2018. We find that the main long run determinant of imports is autonomous demand, through its influence on output. Income distribution does not play a significant role in the long run, but it does so in the short run. The deindustrialization process started in the mid-70s deepened the impact of autonomous demand on imports, reducing the external space to boost output through government spending and/or higher real wages.

Keywords: Sraffian supermultiplier, Thirlwall's law, structural decomposition analysis, income distribution, input-output analysis

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1. INTRODUCTION: INCOME DISTRIBUTION AND THE BALANCE-OF-PAYMENTS CONSTRAINT

Since the mid-1970s, Argentina's economic performance has been disappointing, with a growth rate of only 1.7%, a low number according to both regional and global standards[2]. To explain this phenomenon, several authors have pointed to the lack of foreign currency as the main constraint on the country's economic growth. This hypothesis is supported by the fact that frequent balance-of-payments crises result in a median depreciation rate of the domestic currency of 19%, and that exports, the long-term source of foreign currency, grew at a rate of 4.7%, less than global trade. The argument is simple: higher economic growth requires more imports of intermediate inputs as well as capital and consumption goods and, if exports do not grow at a similar pace than output, then the economy runs out of international reserves and cannot pay for the required imported goods, which limits output growth[3] (Diamand, 1972; Thirlwall, 1979; Prebisch, 1986).

This constraint on output has a direct impact on income distribution. Higher wages increase consumption and aggregate demand; however, since this requires more imports, it threatens the external sustainability of the economy. Therefore, there is a tension between an income distribution more favourable to workers, as demanded by trade unions, and macroeconomic equilibrium, which causes permanent fluctuations in output (Canitrot, 1983; Olivera, 1991). In the long run, it is generally agreed that real wages, due to their impact on imports, cannot permanently increase without being accompanied by higher exports, as Figure 1 clearly shows. Each time wages increased while exports did not, the result was a balance-of-payments crisis and a depreciation that reduced real wages[4].

The advantage of the Sraffian supermultiplier (SSM) is that it displays a number of stylised facts of economies that other heterodox growth models fail to consider, such as the return to a normal degree of capacity utilisation, the positive relationship between the investment share of GDP and output growth and the role of autonomous demand in the determination of long term output growth (Fagundes and Freitas, 2017).

Canonical SSM models focus on closed economies, excluding international trade and financial flows. We include the former by building our multi-sectoral model based on the one developed by Dvoskin and Torchinsky Landau (2022) for a single-good economy. We do not consider the effects of capital flows on balance-of-payments sustainability, which could countervail, at least partially, our results[5].

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[2] Between 1975 and 2019, Latin America and the Caribbean GDP in constant USD grew at an annual rate of 2.7%, and the world at 3.3% (Feenstra, Inklaar and Timmer, 2015).

[3] The balance-of-payments constraint acts as a limit for economic growth rather than as its attractor (Vernengo, 2015). The limit can be reached if there is sufficient aggregate demand. Therefore, what imports limit is the maximum growth rate of the economy, not its effective growth rate (note that a higher import coefficient also affects effective output by replacing domestic production, but this could be compensated by additional demand from alternative sources). In the case of Argentina, frequent balance-of-payments crises suggest that this limit is often reached.

[4] According to certain approaches, a depreciation and the following decrease in real wages could increase exports, relaxing the external constraint. However, this competitiveness would be "spurious" and not socially sustainable, in contrast to "authentic" competitiveness based on productivity increases (Fajnzylber, 1990; Gramkow and Porcile, 2022).

[5] Financial flows, due to their large size, could finance BOP deficits and increase the scope for growth, but they also can also imply a burden for the BOP due to debt repayments. In *bimonetary* economies, saving in foreign

Figure 1. Real wages and exports per worker
Argentina, (1950-2021), constant 2021 USD

Source: The author based on INDEC, Kidyba and Vega (2015) and Kidyba and Suárez (2020)

Dvoskin and Torchinsky Landau (2021) find that, in the short run, there is a maximum value for the real wage that allows for balance-of-payments (BOP) equilibrium, implying a link between income distribution and external sustainability, as claimed by Canitrot (1983). If real wages exceed their maximum value, this gives place to a currency depreciation, which increases domestic prices and brings real wages down, in line with external equilibrium. On its turn, the decrease in real wages might trigger demands for improvements of salaries' pfurchasing power, which creates an wage-price-exchange rate spiral and a cyclical economic dynamic, as structuralist authors argue (Braun and Joy, 1968).

On the contrary, a higher domestic integration of the productive structure, represented by a lower import coefficient, also allows for higher output without leading to BOP crises, as it implies that less imports are required to produce the same amount of output (and exports). Given that income distribution and the productive structure underwent significant changes in the course of Argentinian economic history, it would be expected that they played a significant role in the determination of imports in the short run.

Our model allows us to decompose imports growth between two periods according to its determinants: the growth of autonomous demand, fluctuations in income distribution, changes in the productive technique in use (including the use of imported inputs), and the increase or decrease in the weight of imports in the consumption bundle. According to the results of the open-economy SSM model, we would expect income distribution to play a significant role in the short run, due to the cyclical dynamics of income distribution and the real exchange rate, but that, in the long run, what should prevail is the growth of autonomous components of aggregate demand, which, the SSM model argues, determines output and imports growth.

The remainder of the paper is organised as follows. In Section 2 we present the methodology for building the multi-sectoral supermultiplier model and the data sources. Section 3 discusses the results of the structural decomposition analysis of imports, providing a brief historical account to contextualise these changes. In Section 4, we present the maximum real wage for

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currency by domestic agents could increase outflows. See Thirlwall and Hussain (1982) and Bhering, Freitas and Serrano (2019). External financing could also serve as a tool to increase exports and productive integration, allowing for a higher BOP equilibrium-compatible growth rate.

each considered period and compare it with the dynamics of the actual real wage. Finally, Section 5 provides some concluding remarks.

2. METHODOLOGY: THE SUPERMULTIPLIER IN A MULTI-SECTORAL OPEN ECONOMY

In recent years, there has been a significant increase in the use of the Sraffian supermultiplier model by heterodox economists (Serrano, 1995). This is due to the fact that, while retaining important tenets of previous heterodox growth models, the SSM assumes a flexible accelerator function that allows capacity utilisation to return to its normal levels, and investment to vary in line with output (Fagundes and Freitas, 2017).

The corollary of the SSM is that those expenditures which are autonomous from the current level of spending, such as government spending, exports, or credit-financed consumption, drive long term growth. Spending that depends on income, such as wages or investment, can affect output levels but does not have an impact on long term growth (Nah and Lavoie, 2019). As a result, the policy recommendation that emerges from these models is that an increase in autonomous expenditures (for example, government spending) boosts growth, unless full employment is reached.

This has led to severe criticism of the model. Skott (2016) and Nikiforos (2018), among others, argue that the SSM model ignores the fact that if autonomous spending must be financed out of credit, unsustainable debt relationships might arise. For example, government spending cannot expand faster than output without an increase in public debt if other components of autonomous demand grow at a slower pace (Freitas and Christianes, 2020), while credit-financed private consumption can lead to Minskyan boom-and-bust cycles. Perhaps more importantly for small open economies, higher growth requires an increase in imports and, if exports do not grow at the same pace, this can lead to balance-of-payments crises (Oreiro and Costa Santos, 2022).

Dvoskin and Torchinsky Landau (2022) build an SSM model considering the latter by including the dynamics of foreign debt, the exchange rate and the real wage in the model. They find two main constraints for output growth. First, a long-term limit: the growth rate of domestic autonomous demand components cannot be higher than that of exports. Otherwise, external debt accumulates at an ever-increasing rate, leading to an unsustainable BOP position (McCombie, 1985).

They also find a short-run constraint: output levels cannot exceed a certain level where imports equal exports; otherwise, debt ratios also increase. The authors argue that, if the latter happens, a *structuralist* mechanism comes into play: the growing debt forces a currency depreciation that increases domestic prices and reduces real wages, diminishing the supermultiplier, and therefore output and imports. Wage resistance could lead to a new round of nominal wage increases, creating a spiral of wages, exchange rate, and price increases. Therefore, there is a maximum level of real wages compatible with external equilibrium, which depends on the real variables of the economy such as exports, autonomous domestic spending, and the integration of the productive structure.

In this paper we seek to test if these mechanisms were in place in the Argentinian economy in the long run, between the 1950s and the present. To do so, we adapt the SSM to a multi-sectoral framework which allows us to consider changes in the productive structure and then apply a *structural decomposition* method to imports. This allows us to evaluate whether they grew at a similar pace than exports and identify their main drivers, including autonomous demand growth, changes in income distribution and the productive structure, and modifications in consumption and investment patterns (Skolka, 1989; Miller and Blair, 2009). The difference of this methodology when compared to econometric techniques is that it allows to provide a full decomposition of imports, considering the importance of each determinant, while maintaining a multi-sectoral setting[6].

Several studies use structural decomposition analysis to analyse imports growth. Pamukçu and de Boer (2001) apply it for Turkey, and Pei *et al.* (2011) for China. Chen *et al.* (2015) perform a semi-closed structural decomposition analysis also for China, considering consumption derived from labour income as endogenous. Magacho, McCombie and Guilhoto (2018) perform an SDA analysis for Brazil explicitly considering changes in imports. For Argentina, Sourrouille and Kosacoff (1979) and Bazza, Brondino and Roitbarg (2022) do not use SDA but apply input-output techniques to analyse imports. This paper contributes to this literature by a) applying this technique to Argentina and b) expanding the SDA decomposition to consider both consumption and investment as endogenous and calculating the maximum real wage compatible with balance of payments equilibrium.

We work with the existing input-output matrices for Argentina, available for 1953, 1963, 1973, 1997, 2004, 2011, and 2018[7]. The matrices differ in their number of activities of types and final demands, so we consolidate them into 18 industries and 4 types of final demand (household consumption, public consumption, investment, and exports). Thus, the available matrices display the following structure[8]:

$$\begin{bmatrix} \mathbf{X} & \mathbf{F} & \mathbf{x} \\ \mathbf{m}^T & \mathbf{m}_\mathbf{f}^T & \mathbf{0} \\ \mathbf{w}^T & \mathbf{0} & \mathbf{0} \\ \boldsymbol{\pi}^T & \mathbf{0} & \mathbf{0} \\ \mathbf{x}^T & \mathbf{0} & \mathbf{0} \end{bmatrix} \tag{2.1}$$

X is the intermediate transaction matrix, displaying the sales of intermediate inputs between industries. F is the final demand matrix, which is composed of private consumption ($\mathbf{f_c}$), public consumption ($\mathbf{f_g}$) investment ($\mathbf{f_i}$), and exports ($\mathbf{f_e}$). $\mathbf{m}$ is a vector with the imported intermediate

[6] Econometric studies for import determinants usually find that the most relevant determinant of imports is economic growth rather than other variables such as the exchange rate, which is consistent with our results (McCombie and Thirlwall, 2004; Crane *et al*., 2007; Bussière *et al.*, 2011; Abeles and Cherkasky, 2020).

[7] Matrices for 1953, 1963 and 1973 are published in (CEPAL, 1983). The matrix for 1997 was elaborated by INDEC (*Instituto Nacional de Estadísticas y Censos*). Matrices for 2004, 2011 and 2018, as well as their corresponding vectors of wages and employment, are estimated based on the Supply-Use tables and other national accounting, employment and wages data published by INDEC and OEDE (*Observatorio de Empleo y Dinámica Empresarial*). Matrices are at current prices, so changes in relative prices can affect results.

[8] Vectors are represented by lower-case bold characters (e.g. $\mathbf{z}$) and are always column vectors of dimension n x 1 (being n the number of industries) unless it is explicitly specified that they are transposed (e.g. $\mathbf{z}^T$). Matrices are indicated by upper-case bold characters (e.g. $\mathbf{H}$), except diagonalized vectors (matrices with a vector on its main diagonal and zeros on the other cells), represented as lower case-characters with a hat (e.g. $\hat{\mathbf{z}}$). Scalars are represented as lower case-italicised characters (e.g. m_c).

inputs. $\mathbf{m_f}$ displays the final imports, split between consumption imports ($\mathrm{m_c}$), investment imports ($\mathrm{m_i}$), imports for government consumption ($\mathrm{m_g}$) and re-exports ($\mathrm{m_x}$). Vector $\mathbf{w}$ contains the wage bill paid by each sector, whereas $\boldsymbol{\pi}$ displays the other value-added components (profits, taxes net of subsidies, and mixed income). Finally, vector $\mathbf{x}$ is the gross output per sector. Matrices are originally at current prices, and they are converted to US dollars.

In system (2.1) the "spending identity" holds:

$$\mathbf{x} = \mathbf{Xe} + \mathbf{f} \tag{2.2}$$

Where $\mathbf{e}$ is a "sum" vector, of dimension 18 × 1, that displays 1 as value on all its cells, and is used to be pre- or post-multiplied by other vectors and matrices in order to sum them by column or row, respectively. Equation (2.2) implies that gross output is spent on intermediate inputs and final goods and services ($\mathbf{f} = \mathbf{Fe}$).

Being $\mathbf{A} = \mathbf{Z}\hat{\mathbf{x}}^{-1}$ the direct requirements matrix, we can solve the system for x:

$$\mathbf{x} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{f} = \mathbf{Lf} \tag{2.3}$$

Where $\mathbf{L}$ is the well-known Leontief matrix (Leontief, 1951). This is what is known as an "open" Leontief system: the productive technique, represented by matrix $\mathbf{L}$, and final demand $\mathbf{f}$ determine total gross output $\mathbf{x}$. Note also that each industry's gross output depends not only on its own final demand but also on all other industries' demand, making explicit the interdependency of the economy (Miller and Blair, 2009, p. 19). By following this simple structure we can easily calculate the determinants of intermediate imports. Defining $\mathbf{a_m^{\mathit{T}}} = \mathbf{m}^T\hat{\mathbf{x}}^{-1}$ as a vector of requirements of imported intermediate inputs per unit of output in each sector, total imported intermediate inputs equal to:

$$\mathbf{e}^T\mathbf{m} = \boldsymbol{a}_{\boldsymbol{m}}^T(\boldsymbol{I} - \boldsymbol{A})^{-1}\boldsymbol{f} \tag{2.4}$$

Based on this expression, we could decompose the dynamics of intermediate imports among the periods examined, considering whether they are due to changes in the import coefficients, the productive technique, or final demand. However, before moving further, it is worth discussing an additional issue: we are treating final demand $\mathbf{f}$ as if all its components were autonomous from output levels $\mathbf{x}$. While this is likely to be true for some of its components, such as exports, government spending, or credit-financed consumption, it is unlikely that consumption is autonomous from the current level of output, particularly for workers, for whom wages represent the main source of income.

Moreover, following the supermultiplier approach, investment is not exogenous but depends on output levels, in order to maintain a certain level of "normal" capacity utilisation. To consider these features we build a "closed" input-output model (Miyazawa, 1976). We first turn our attention to consumption. We assume, in a Kaleckian fashion, that workers do not save, so income distribution has a direct impact on the overall saving propensity of the economy and, therefore, on output. We define a matrix $\mathbf{A^c}$ that displays the consumption derived from final demand:

$$\mathbf{A^c} = \frac{\mathbf{f_c}}{\mathbf{e}^T\mathbf{f_c} + m_c}\mathbf{a_w^{\mathit{T}}} \tag{2.5}$$

Where $\mathbf{f_c}$ is the final demand vector from matrix $\mathbf{F}$, m_c is a scalar representing the imports of final consumption goods from vector $\mathbf{m_f}$, and $\mathbf{a_w}^T = \mathbf{w}^T\hat{\mathbf{x}}^{-1}$ is a vector with the wages paid per unit of output in each sector. Therefore, matrix $\mathbf{A^c}$ contains the additional "inputs" required per unit of output due to the fact that production requires labour, which is paid a wage that is eventually spent on consumption goods. We can derive a matrix of "socio-technical" coefficients, $\mathbf{A^c} + \mathbf{A}$, which displays in each column all inputs required to produce one unit of output, including direct and indirect inputs, as well as those required to produce the labour force employed in production (Petri, 2021, p. 95).

Note that by implementing this procedure we are assuming that all capitalists' consumption is autonomous. This does not mean that capitalists' consumption does not require imports, but that the level of this demand will be independent of capitalists' current income.

Investment must also be considered as endogenous to output in a supermultiplier model, because firms aim to maintain a normal degree of capacity utilisation. To include this feature we estimate a matrix of capital requirements per unit of output for each year[9].

$$\mathbf{A_i} = \frac{\mathbf{f_i}}{\mathbf{e}^{\mathrm{T}}\mathbf{f_i} + m_i}\mathbf{a_k}^{\mathrm{T}} \tag{2.6}$$

Where $\mathbf{a_k}$ is a vector representing the capital required per unit of output. Unlike in the case of consumption, where we have information for the wage bill, there is no data on capital stock or investment in each sector, so we establish a common value for all sectors, implying that all the positions in $\mathbf{a_k}$ take the value $\mathbf{e}^{\mathrm{T}}\mathbf{f_i}(\mathbf{e}^{\mathrm{T}}\mathbf{x})^{-1}$. This implies that all sectors are assumed to have the same desired capital-output ratio, and purchase capital goods produced by the same sectors (or by foreign countries). While this is a bold assumption, it guarantees system consistency while allowing for investment endogeneity without affecting the aggregate estimations[10]. Given the restrictiveness of this assumption, in Annex I an alternative decomposition is performed where investment is considered an exogenous variable, yielding similar results.

Therefore, we can redefine the spending equation as:

$$\mathbf{x} = (\mathbf{I} - \mathbf{A} - \mathbf{A_i} - \mathbf{A_c})^{-1}\mathbf{f_z} \tag{2.7}$$

Note that investment and workers' consumption are now determined endogenously, and output depends not on total final demand but on its autonomous part $\mathbf{f_z}$, which comprises exports, government spending and the part of consumption that is not explained by wages. The

[9] For previous works that include endogenous investment in an input-output setting, see Metcalfe and Steedman (1981), Mongiovi (2011) or Mariolis and Ntemiroglou (2023).

[10] Not necessarily all capital expenditures must be considered as induced. Some types of investment, such as R&D or the purchase of new capital assets due to changes in technology are fundamentally exogenous (Deleidi and Mazzucato, 2019). However, due to the aggregation of the matrices it is impossible to separate between autonomous and exogenous investment. Given the higher importance of the former all investment is considered as endogenous.

expression $(\mathbf{I}-\mathbf{A}-\mathbf{A_i}-\mathbf{A_c})^{-1}$ is the supermultiplier written in a multi-sectoral form[11], considering consumption propensities (due to wages) and the investment ratio. Higher autonomous consumption, wages or requirements of capital per unit of output will increase demand and gross output.

As in equation (2.4), we can now rewrite intermediate imports as endogenous, but now depending on autonomous final demand (rather than on total final demand) and our "expanded" technical coefficients matrix.

$$\mathbf{e}^T\mathbf{m} = \mathbf{a}_\mathbf{m}^\mathrm{T}(\mathbf{I}-\mathbf{A}-\mathbf{A_i}-\mathbf{A_c})^{-1}\mathbf{f_z} \tag{2.8}$$

Therefore, changes in autonomous demand, income distribution, or the investment coefficients will cause not only changes in output, but also in the volume of imports. To distinguish the effect of income distribution from that of technique (considering the investment coefficient as a part of the latter), we can apply the Sherman-Morrison formula, which implies that:

$$\mathbf{e}^T\mathbf{m} = \mathbf{a}_\mathbf{m}^T[\mathbf{I}-(\mathbf{I}-\mathbf{A}-\mathbf{A_i})^{-1}\mathbf{A_c}]^{-1}[\mathbf{I}-\mathbf{A}-\mathbf{A_i}]^{-1}\mathbf{f_Z} = \mathbf{a}_\mathbf{m}^\mathrm{T}\mathbf{L_w}\mathbf{L_i}\mathbf{f_Z} \tag{2.9}$$

The first bracket, which we call $\mathbf{L_w}$, is the "augmenting" effect of induced consumption on output and imports. The second bracket $\mathbf{L_i}$ is the Leontief matrix, expanded to include the requirements of fixed capital. Therefore, we have conducted a complete decomposition of intermediate imports between the causes of their variation.

What about final imports? A part of induced consumption is not spent on domestic but on imported consumption goods; therefore, if we define the consumption of imported goods per unit of autonomous demand as $a_{cm} = m_c/(\mathbf{e}^T\mathbf{f_c}+m_c)$, then induced imports of consumption goods are:

$$m_{cz} = \mathbf{a}_\mathbf{w}^T\mathbf{a_{cm}}\mathbf{L_w}\mathbf{L_i}\mathbf{f_z} \tag{2.10}$$

Induced final consumption imports m_{cz} differ from total consumption imports m_c because part of consumption (domestic and imported) is autonomous from income. Regarding investment, part of the equipment required for adjusting the capital stock to demand is imported, so induced investment can be represented as:

$$m_{iz} = \mathbf{a}_\mathbf{k}^T\mathbf{a_{im}}\mathbf{L_w}\mathbf{L_i}\mathbf{f_z} \tag{2.11}$$

Note that since all investment is considered induced, $m_{iz} = m_i$. Imports not related to induced consumption, plus imports for government spending and exports are autonomous:

$$m_{aut} = (m_c - m_{cz}) + m_g + m_x \tag{2.12}$$

[11] Note that this resembles to the standard one-sector supermultiplier equation: $y = \frac{1}{1-c-h}z$. It differs from it due to the fact that the explained variable is gross output (x) rather than net (y), and that the consumption propensity is considered to depend on income distribution, as in the Kaleckian multiplier (Kalecki, 1954).

Therefore, final imports are decomposed into those required by induced consumption, those required to maintain the capital stock at compatible levels with output, and an autonomous component:

$$m_f = \mathbf{a}_{\mathbf{w}}^T \mathbf{a}_{\mathbf{cm}} \mathbf{L}_{\mathbf{w}} \mathbf{L}_{\mathbf{i}} \mathbf{f}_{\mathbf{z}} + \mathbf{a}_{\mathbf{k}}^T \mathbf{a}_{\mathbf{im}} \mathbf{L}_{\mathbf{w}} \mathbf{L}_{\mathbf{i}} \mathbf{f}_{\mathbf{z}} + m_{aut} \tag{2.13}$$

Applying the decomposition developed in equation (2.9), total imports can be explained by several factors: a) the import propensity of production, b) the productive technique in use, c) income distribution, d) the consumption and investment import coefficients, e) autonomous imports, and f) autonomous demand.

$$\mathbf{e}^T \mathbf{m} = (\mathbf{a}_{\mathbf{m}}^T + \mathbf{a}_{\mathbf{w}}^T a_{cm} + \mathbf{a}_{\mathbf{k}}^T a_{im}) \mathbf{L}_{\mathbf{w}} \mathbf{L}_{\mathbf{i}} \mathbf{f}_{\mathbf{Z}} + m_{aut} \tag{2.14}$$

Equation (2.14) allows us to study total imports as a completely endogenous result of the economic process and, more importantly, to study the causes behind their change. We can do this by performing a *structural decomposition analysis* (Skolka, 1989). SDA is not unique since we can calculate multiple potential decompositions according to the ordering of the variables. Following Dietzenbacher and Los (1998), we calculate the average of the two polar decompositions as a good approximation to the average of all decompositions. We can define the change on imports between period t and $t-1$ as:

$$\begin{aligned}
\mathbf{e}^T \boldsymbol{m}^{\boldsymbol{t}} - \mathbf{e}^T \boldsymbol{m}^{\boldsymbol{t-1}} \\
= \frac{1}{2} \Big\{ & \Big[\Big(\mathbf{a}_{\mathbf{m}}^{T\,t} - \mathbf{a}_{\mathbf{m}}^{T\,t-1} \Big) \mathbf{L}_{\mathbf{w}}^t \mathbf{L}_{\mathbf{i}}^t \mathbf{f}_{\mathbf{z}}^t \Big] \\
& + \Big[\Big(\mathbf{a}_{\mathbf{m}}^{T\,t-1} + a_{cm}^{t-1} \mathbf{a}_{\mathbf{w}}^{T\,t-1} + a_{im}^{t-1} \mathbf{a}_{\mathbf{k}}^{T\,t-1} \Big) (\mathbf{L}_{\mathbf{w}}^t - \mathbf{L}_{\mathbf{w}}^{t-1}) \mathbf{L}_{\mathbf{i}}^t \mathbf{f}_{\mathbf{z}}^t \\
& + a_{cm}^{t-1} \Big(\mathbf{a}_{\mathbf{w}}^{T\,t} - \mathbf{a}_{\mathbf{w}}^{T\,t-1} \Big) \mathbf{L}_{\mathbf{w}}^t \mathbf{L}_{\mathbf{i}}^t \mathbf{f}_{\mathbf{z}}^t \Big] \\
& + \Big[\Big(\mathbf{a}_{\mathbf{m}}^{T\,t-1} + a_{cm}^{t-1} \mathbf{a}_{\mathbf{w}}^{T\,t-1} + a_{im}^{t-1} \mathbf{a}_{\mathbf{k}}^{T\,t-1} \Big) \mathbf{L}_{\mathbf{w}}^{t-1} \big(\mathbf{L}_{\mathbf{i}}^t - \mathbf{L}_{\mathbf{i}}^{t-1} \big) \mathbf{f}_{\mathbf{z}}^t \\
& + a_{im}^{t-1} \Big(\mathbf{a}_{\mathbf{k}}^{T\,t} - \mathbf{a}_{\mathbf{k}}^{T\,t-1} \Big) \mathbf{L}_{\mathbf{w}}^t \mathbf{L}_{\mathbf{i}}^t \mathbf{f}_{\mathbf{z}}^t \Big] \\
& + \Big[\Big(\mathbf{a}_{\mathbf{m}}^{T\,t-1} + a_{cm}^{t-1} \mathbf{a}_{\mathbf{w}}^{T\,t-1} + a_{im}^{t-1} \mathbf{a}_{\mathbf{k}}^{T\,t-1} \Big) \mathbf{L}_{\mathbf{w}}^{t-1} \mathbf{L}_{\mathbf{i}}^{t-1} (\mathbf{f}_{\mathbf{x}}^t - \mathbf{f}_{\mathbf{x}}^{t-1}) \Big] \\
& + \Big[\Big(\mathbf{a}_{\mathbf{m}}^{T\,t-1} + a_{cm}^{t-1} \mathbf{a}_{\mathbf{w}}^{T\,t-1} + a_{im}^{t-1} \mathbf{a}_{\mathbf{k}}^{T\,t-1} \Big) \mathbf{L}_{\mathbf{w}}^{t-1} \mathbf{L}_{\mathbf{i}}^{t-1} \big(\mathbf{f}_{\mathbf{d}}^t - \mathbf{f}_{\mathbf{d}}^{t-1} \big) \Big] \\
& + \Big[(a_{cm}^t - a_{cm}^{t-1}) \mathbf{a}_{\mathbf{w}}^{T\,t} \mathbf{L}_{\mathbf{w}}^t \mathbf{L}_{\mathbf{i}}^t \mathbf{f}_{\mathbf{z}}^t \Big] + \Big[\big(a_{im}^t - a_{im}^{t-1} \big) \mathbf{a}_{\mathbf{k}}^{T\,t} \mathbf{L}_{\mathbf{w}}^t \mathbf{L}_{\mathbf{i}}^t \mathbf{f}_{\mathbf{z}}^t \Big] \Big\} \\
+ \frac{1}{2} \Big\{ & \Big[\Big(\mathbf{a}_{\mathbf{m}}^{T\,t} - \mathbf{a}_{\mathbf{m}}^{T\,t-1} \Big) \mathbf{L}_{\mathbf{w}}^{t-1} \mathbf{L}_{\mathbf{i}}^{t-1} \mathbf{f}_{\mathbf{z}}^{t-1} \Big] \\
& + \Big[\Big(\mathbf{a}_{\mathbf{m}}^{T\,t} + a_{cm}^t \mathbf{a}_{\mathbf{w}}^{T\,t} + a_{im}^t \mathbf{a}_{\mathbf{k}}^{T\,t} \Big) (\mathbf{L}_{\mathbf{w}}^t - \mathbf{L}_{\mathbf{w}}^{t-1}) \mathbf{L}_{\mathbf{i}}^{t-1} \mathbf{f}_{\mathbf{z}}^{t-1} \Big] \\
& + \Big[a_{cm}^t \Big(\mathbf{a}_{\mathbf{w}}^{T\,t} - \mathbf{a}_{\mathbf{w}}^{T\,t-1} \Big) \mathbf{L}_{\mathbf{w}}^{t-1} \mathbf{L}_{\mathbf{i}}^{t-1} \mathbf{f}_{\mathbf{z}}^{t-1} \Big] \\
& + \Big[\Big(\mathbf{a}_{\mathbf{m}}^{T\,t} + a_{cm}^t \mathbf{a}_{\mathbf{w}}^{T\,t} + a_{im}^t \mathbf{a}_{\mathbf{k}}^{T\,t} \Big) \mathbf{L}_{\mathbf{w}}^t \big(\mathbf{L}_{\mathbf{i}}^t - \mathbf{L}_{\mathbf{i}}^{t-1} \big) \mathbf{f}_{\mathbf{z}}^{t-1} \Big] \\
& + \Big[a_{im}^t \Big(\mathbf{a}_{\mathbf{k}}^{T\,t} - \mathbf{a}_{\mathbf{k}}^{T\,t-1} \Big) \mathbf{L}_{\mathbf{w}}^{t-1} \mathbf{L}_{\mathbf{i}}^{t-1} \mathbf{f}_{\mathbf{z}}^{t-1} \Big] \\
& + \Big[\Big(\mathbf{a}_{\mathbf{m}}^{T\,t} + a_{cm}^t \mathbf{a}_{\mathbf{w}}^{T\,t} + a_{im}^t \mathbf{a}_{\mathbf{k}}^{T\,t} \Big) \mathbf{L}_{\mathbf{w}}^t \mathbf{L}_{\mathbf{i}}^t (\mathbf{f}_{\mathbf{x}}^t - \mathbf{f}_{\mathbf{x}}^{t-1}) \Big] \\
& + \Big[\Big(\mathbf{a}_{\mathbf{m}}^{T\,t} + a_{cm}^t \mathbf{a}_{\mathbf{w}}^{T\,t} + a_{im}^t \mathbf{a}_{\mathbf{k}}^{T\,t} \Big) \mathbf{L}_{\mathbf{w}}^t \mathbf{L}_{\mathbf{i}}^t \big(\mathbf{f}_{\mathbf{d}}^t - \mathbf{f}_{\mathbf{d}}^{t-1} \big) \Big] \\
& + \Big[(a_{cm}^t - a_{cm}^{t-1}) \mathbf{a}_{\mathbf{w}}^{T\,t-1} \mathbf{L}_{\mathbf{w}}^{t-1} \mathbf{L}_{\mathbf{i}}^{t-1} \mathbf{f}_{\mathbf{z}}^{t-1} \Big] \\
& + \Big[\big(a_{im}^t - a_{im}^{t-1} \big) \mathbf{a}_{\mathbf{k}}^{T\,t-1} \mathbf{L}_{\mathbf{w}}^{t-1} \mathbf{L}_{\mathbf{i}}^{t-1} \mathbf{f}_{\mathbf{z}}^{t-1} \Big] \Big\} + [m_{aut}^t - m_{aut}^{t-1}]
\end{aligned} \tag{2.15}$$

Equation (2.15) shows the full decomposition of imports among its determinants. This expression can be divided into 8 main determinants, if we split autonomous demand into exports ($\mathbf{f_x}$) and domestic autonomous demand ($\mathbf{f_d}$)[12]. These are represented in Table 1.

Table 1. Determinants of Imports Growth

Determinant	Value
Import coefficient	$\left(\mathbf{a}_\mathbf{m}^{T\,t} - \mathbf{a}_\mathbf{m}^{T\,t-1}\right)\left[\frac{1}{2}\left(\mathbf{L}_\mathbf{w}^t\mathbf{L}_\mathbf{i}^t\mathbf{f}_\mathbf{z}^t\right) + \frac{1}{2}\left(\mathbf{L}_\mathbf{w}^{t-1}\mathbf{L}_\mathbf{i}^{t-1}\mathbf{f}_\mathbf{z}^{t-1}\right)\right]$
Income distribution	$\frac{1}{2}\left[\left(\mathbf{a}_\mathbf{m}^{T\,t-1} + a_{cm}^{t-1}\,\mathbf{a}_\mathbf{w}^{T\,t-1} + a_{im}^{t-1}\,\mathbf{a}_\mathbf{k}^{T\,t-1}\right)\left(\mathbf{L}_\mathbf{w}^t - \mathbf{L}_\mathbf{w}^{t-1}\right)\mathbf{L}_\mathbf{i}^t\mathbf{f}_\mathbf{z}^t + a_{cm}^{t-1}\left(\mathbf{a}_\mathbf{w}^{T\,t} - \mathbf{a}_\mathbf{w}^{T\,t-1}\right)\mathbf{L}_\mathbf{w}^t\mathbf{L}_\mathbf{i}^t\mathbf{f}_\mathbf{z}^t\right] + \frac{1}{2}\left[\left(\mathbf{a}_\mathbf{m}^{T\,t} + a_{cm}^{t}\mathbf{a}_\mathbf{w}^{T\,t} + a_{im}^{t}\mathbf{a}_\mathbf{k}^{T\,t}\right)\left(\mathbf{L}_\mathbf{w}^t - \mathbf{L}_\mathbf{w}^{t-1}\right)\mathbf{L}_\mathbf{i}^{t-1}\mathbf{f}_\mathbf{z}^{t-1} + a_{cm}^{t}\left(\mathbf{a}_\mathbf{w}^{T\,t} - \mathbf{a}_\mathbf{w}^{T\,t-1}\right)\mathbf{L}_\mathbf{w}^{t-1}\mathbf{L}_\mathbf{i}^{t-1}\mathbf{f}_\mathbf{z}^{t-1}\right]$
Technique	$\frac{1}{2}\left[\left(\mathbf{a}_\mathbf{m}^{T\,t-1} + a_{cm}^{t-1}\,\mathbf{a}_\mathbf{w}^{T\,t-1} + a_{im}^{t-1}\,\mathbf{a}_\mathbf{k}^{T\,t-1}\right)\mathbf{L}_\mathbf{w}^{t-1}\left(\mathbf{L}_\mathbf{i}^t - \mathbf{L}_\mathbf{i}^{t-1}\right)\mathbf{f}_\mathbf{z}^t + a_{im}^{t-1}\left(\mathbf{a}_\mathbf{k}^{T\,t} - \mathbf{a}_\mathbf{k}^{T\,t-1}\right)\mathbf{L}_\mathbf{w}^t\mathbf{L}_\mathbf{i}^t\mathbf{f}_\mathbf{z}^t\right] + \frac{1}{2}\left[\left(\mathbf{a}_\mathbf{m}^{T\,t} + a_{cm}^{t}\mathbf{a}_\mathbf{w}^{T\,t} + a_{im}^{t}\mathbf{a}_\mathbf{k}^{T\,t}\right)\mathbf{L}_\mathbf{w}^t\left(\mathbf{L}_\mathbf{i}^t - \mathbf{L}_\mathbf{i}^{t-1}\right)\mathbf{f}_\mathbf{z}^{t-1} + a_{im}^{t}\left(\mathbf{a}_\mathbf{k}^{T\,t} - \mathbf{a}_\mathbf{k}^{T\,t-1}\right)\mathbf{L}_\mathbf{w}^{t-1}\mathbf{L}_\mathbf{i}^{t-1}\mathbf{f}_\mathbf{z}^{t-1}\right]$
Exports	$\left[\frac{1}{2}\left(\mathbf{a}_\mathbf{m}^{T\,t-1} + a_{cm}^{t-1}\,\mathbf{a}_\mathbf{w}^{T\,t-1} + a_{im}^{t-1}\,\mathbf{a}_\mathbf{k}^{T\,t-1}\right)\mathbf{L}_\mathbf{w}^{t-1}\mathbf{L}_\mathbf{i}^{t-1} + \frac{1}{2}\left(\mathbf{a}_\mathbf{m}^{T\,t} + a_{cm}^{t}\mathbf{a}_\mathbf{w}^{T\,t} + a_{im}^{t}\mathbf{a}_\mathbf{k}^{T\,t}\right)\mathbf{L}_\mathbf{w}^t\mathbf{L}_\mathbf{i}^t\right]\left(\mathbf{f}_\mathbf{x}^t - \mathbf{f}_\mathbf{x}^{t-1}\right)$
Autonomous demand	$\left[\frac{1}{2}\left(\mathbf{a}_\mathbf{m}^{T\,t-1} + a_{cm}^{t-1}\,\mathbf{a}_\mathbf{w}^{T\,t-1} + a_{im}^{t-1}\,\mathbf{a}_\mathbf{k}^{T\,t-1}\right)\mathbf{L}_\mathbf{w}^{t-1}\mathbf{L}_\mathbf{i}^{t-1} + \frac{1}{2}\left(\mathbf{a}_\mathbf{m}^{T\,t} + a_{cm}^{t}\mathbf{a}_\mathbf{w}^{T\,t} + a_{im}^{t}\mathbf{a}_\mathbf{k}^{T\,t}\right)\mathbf{L}_\mathbf{w}^t\mathbf{L}_\mathbf{i}^t\right]\left(\mathbf{f}_\mathbf{d}^t - \mathbf{f}_\mathbf{d}^{t-1}\right)$
Imported consumption prop.	$\left(a_{cm}^t - a_{cm}^{t-1}\right)\left[\frac{1}{2}\mathbf{a}_\mathbf{w}^{T\,t}\mathbf{L}_\mathbf{w}^t\mathbf{L}_\mathbf{i}^t\mathbf{f}_\mathbf{z}^t + \frac{1}{2}\mathbf{a}_\mathbf{w}^{T\,t-1}\mathbf{L}_\mathbf{w}^{t-1}\mathbf{L}_\mathbf{i}^{t-1}\mathbf{f}_\mathbf{z}^{t-1}\right]$
Imported investment prop.	$\left(a_{im}^t - a_{im}^{t-1}\right)\left[\frac{1}{2}\mathbf{a}_\mathbf{k}^{T\,t}\mathbf{L}_\mathbf{w}^t\mathbf{L}_\mathbf{i}^t\mathbf{f}_\mathbf{z}^t + \frac{1}{2}\mathbf{a}_\mathbf{k}^{T\,t-1}\mathbf{L}_\mathbf{w}^{t-1}\mathbf{L}_\mathbf{i}^{t-1}\mathbf{f}_\mathbf{z}^{t-1}\right]$
Autonomous imports	$m_{aut}^t - m_{aut}^{t-1}$

The import coefficient determinant captures the effect of changes in the requirement of imported intermediate goods per unit of output on total imports. Income distribution represents how changes in the wage share affect induced consumption and, therefore, imports. The technique component displays the effect of changes in the expanded Leontief matrix on

[12] A structural decomposition implies studying the change in one variable while assuming that the others remain constant. However, as Dietzenbacher and Los (2000) discuss, some variables of an input-output decomposition are not independent from each other, since, for example, an increase in the imported inputs coefficient, a_m, will be accompanied by a reduction in domestic technical coefficients A since $e^T A + a_m^T + a_w^T + a_\pi^T = e^T$ (being $a_\pi^T = \pi^T \hat{x}^{-1}$). We tested for correlation between these variables, finding a relatively high correlation (-0.40) between $e^T A$ and a_w^T, which might affect the effect of each of these variables. However, it should be noted that the correlation between $e^T A$ and a_π^T is significantly higher (-0.71), implying that changes in technical coefficients have a stronger effect on other value-added components than in wages, which are not part of the decomposition. There is also a smaller correlation between $e^T A$ and a_m^T (-0.23). This can affect results in the decomposition, but not in Figure 2, where changes in technical coefficients and in imported inputs are considered together.

imports. Exports and autonomous demand show how these two determinants affect output and, as a result, imports, by causing changes in intermediate imports but also in imports of final consumption and investment goods. Changes in the imported consumption and investment propensities affect total imports because when these goods and services are needed, they will be sourced abroad or produced domestically in different proportions in each period. Finally, variations in final imports not explained by the previous factors are considered changes in "autonomous" imports.

In the following section, we evaluate the importance of these different factors on imports' growth. According to the SSM approach, we would expect to find a significant role for autonomous demand in the long run, as well as a role for changes in the import coefficient due to the integration (or disintegration) of the productive structure. On the contrary, income distribution should have an impact in the short run due to changes in the exchange rate and therefore in the price level and the real wage, but little significance in the long run growth rate of imports. In the following section we analyse the results of implementing this methodology to the Argentinian economy.

Before moving to the results, we can also derive, following the model by Dvoskin and Torchinsky Landau (2022), the maximum real wage rate compatible with BOP equilibrium. Let us remember that imports and workers' remuneration are linked due to the fact that higher real wages increase consumption and demand, leading to a higher need of imported inputs and final consumption goods. To do so, we must balance imports from equation (2.14) with exports, by multiplying wages by a coefficient γ that adjusts them to their external equilibrium value. If effective imports exceed exports, γ will be lower than one, and if there is a BOP surplus, it will be higher. Therefore, we have:

$$\mathbf{f_x} = (\mathbf{a_m}^T + \gamma \mathbf{a_w}^T \mathbf{a_{cm}} + \mathbf{a_k}^T \mathbf{a_{im}})[\mathbf{I} - (\mathbf{I} - \mathbf{A} - \mathbf{A_i})^{-1} \gamma \mathbf{A_c}]^{-1} \mathbf{L_i} \mathbf{f_Z} + m_{aut} \qquad (2.16)$$

Note that γ appears twice in equation (2.16), once affecting the matrix of augmented consumption coefficients $\mathbf{L_w}$, which leads to higher output and therefore higher imports, and another multiplying the impact of economic activity on consumption goods imports. Due to the impossibility of reaching an algebraic solution, we apply a recursive method to solve for γ, which allows us to determine the change in wages required to equilibrate the trade balance. We calculate equation (2.16) testing for values for γ ranging from 0 to 2 every 0.01. The value of γ that leads to the result closer to the equality is the coefficient the real wage must be multiplied for to obtain balance-of-payments equilibrium[13].

3. WHY IMPORTS GROW? A STRUCTURAL DECOMPOSITION ANALYSIS

In this section we present the results of applying the structural decomposition method to the Argentinian input output matrices between 1953 and 2018. We provide some insights on the main changes underwent by the economy to explain the results, but we do not aim at providing a full historical account of the Argentinian economic history, which would largely exceed the goal of this paper.

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[13] When the system is solved with the γ resulting from the recursive process, trade balances never exceed 0.03% of their original amount.

Table 2 displays the results of the decomposition of imports based on equation (2.15). If we compare 2018 with 1953, a period long enough to consider it to show long run tendencies, we find support for the results of our model[14]. Exports and imports, shown in the first section of the table, tend to grow at a similar rate, since the former provide the foreign currency required to finance purchases abroad.

The second section of the table displays the determinants of imports growth. The decomposition analysis shows that the most important factor is autonomous demand, both domestic and foreign. The domestic components (government spending and autonomous consumption) play a more significant role than exports, given the higher weight of the former in total autonomous demand. Altogether, both autonomous demand components explain almost 60% of total import variation.

In the long run we also observe that the regressive changes in the productive structure also boosted imports, reducing the margin for economic growth. A higher import coefficient, as well as a higher percentage of investment being sourced abroad due to the progressive loss of domestic capacities were only partially offset by a change in technique. Altogether, these changes in the productive structure increased imports by 1.3 p.p. annually. If the productive structure would have remained unaltered, this external space could have been used to increase furthermore autonomous demand or wages.

Table 2. Decomposition of imports growth

Argentina, (1953-2018), constant 2021 USD, annualized growth rates

	1953-2018	1953-1963	1963-1973	1973-1997	1997-2004	2004-2011	2011-2018
Exports growth	7.2%	10.6%	7.6%	8.1%	3.4%	11.6%	-1.4%
Imports Growth	7.9%	10.9%	7.0%	10.3%	-4.0%	18.0%	-0.3%
Aut. domestic demand	4.1%	5.1%	4.0%	6.8%	-4.8%	7.9%	1.2%
Exports	1.6%	1.8%	2.1%	1.9%	0.6%	3.3%	-0.2%
Import coefficient	0.9%	2.6%	-0.9%	1.2%	2.3%	-1.1%	1.9%
Technique	-0.2%	-1.5%	2.9%	-0.2%	-0.6%	0.8%	-1.0%
Imported inv. prop.	0.4%	4.0%	-4.5%	0.7%	0.4%	-0.9%	0.6%
Income distribution	-0.2%	-2.2%	2.3%	-2.3%	-1.2%	4.0%	-1.0%
Imported cons. prop.	0.6%	0.3%	0.3%	0.7%	-0.1%	1.3%	-1.0%
Autonomous imports	0.7%	0.7%	0.8%	1.5%	-0.6%	2.6%	-0.8%

Source: The author based on INDEC, CEPAL (1983) and Kidyba and Vega (2015)

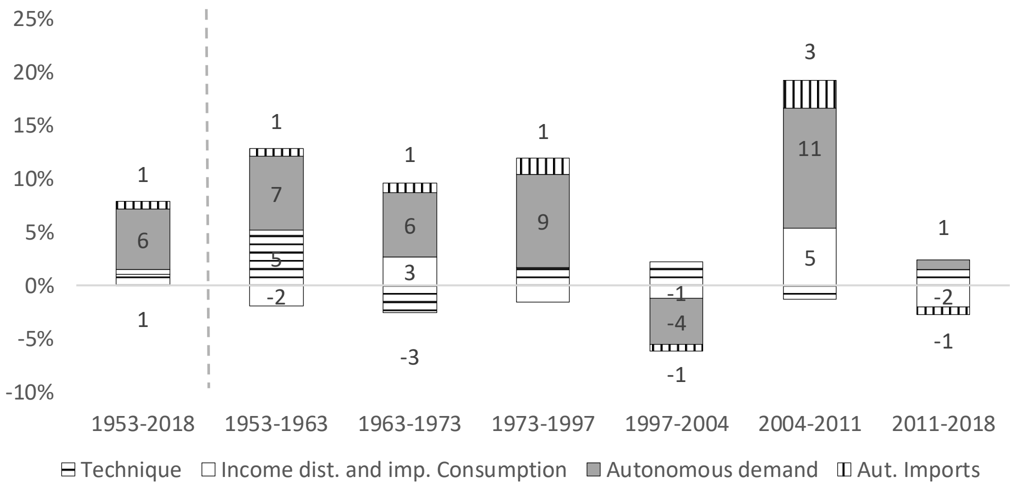
On the contrary, income distribution seems to have played a small role in the long run —but, as we will see, it was a relevant factor in the short run. The regressive change in income distribution between 1953 and 2018 implied that imports annual growth was only 0.2 p.p. lower than it would have been with an unchanged distribution between wages and profits. As a matter of fact, the increased importance of imported goods and services in the consumption bundle of workers had a stronger effect in imports —increasing them by 0.6 p.p. annually— than distribution itself.

[14] Note that while we define the comparison between 1953 and 2018 as the "long run" due to its length, it is not qualitatively different from "short run" comparisons, and the latter must add up to the "long run" effect, which is a limitation of the analysis.

That does not mean that income distribution is irrelevant in the short run, as we would expect from the expanded supermultiplier model. Indeed, it did play a significant role, leading to higher imports in periods of higher real wages and real exchange rate appreciation, such as 1963-1973 and 2004-2011, when the wage share of output increased. On the contrary, when these distributive policies led to trade deficits and depreciations, real wages (and/or employment) fell due to price increases, which reduced imports and helped restoring the external balance (for example, in the periods comprising 1953-1963, 1973-2004 and 2011-2018).

Figure 2**. Decomposition of imports growth**

Argentina, (1953-2018), constant 2021 USD, annualized growth rates



Source: The author based on INDEC, CEPAL (1983) and Kidyba and Vega (2015)

In the short run, besides the adjustment of income distribution, other factors played a significant role driving imports upwards or downwards, therefore affecting the margin for improving income distribution or expanding autonomous demand. In the first period under consideration, between 1953 and 1963, imports grew at an annualised rate of 10.9%. The main source of growth was the increase in autonomous demand, which raised imports by 6.9 p.p. This effect was strengthened by an increase in the import coefficient, which raised imports by 2.6 p.p., altogether with a significant impact of the higher reliance on imported capital goods (+4.0 p.p.). These results can be explained by the fact that the Argentinian economy was undergoing a "light" period of its import substitution process, with high growth rates but an unbalanced productive structure, which led to an increase in imports of capital goods imported inputs. On the contrary, workers' consumption had a negative effect on imports' growth, due to the fact that wages lagged behind productivity during the period, reducing the wage share.

The determinants of imports growth between 1963 and 1973 show some changes. While autonomous demand was again the largest engine of import growth (+6.1 p.p.), income distribution now displays a positive effect on imports (+2.3 p.p.) thanks to the increase in real wages. The productive structure seems to have become more integrated, reducing imports growth by 0.9 p.p. thanks to the decrease in the requirement of imported intermediate inputs, and by 4.5 p.p. due to the lower reliance on foreign capital goods. These productive changes can be understood as part of a process of deepening of the industrialisation process, with the development of several basic goods industries, several of them by the State (Sourrouille and Kosacoff, 1979).

The extensive period 1973-1997 is not easy to analyse due to its extension[15]. During this period, again, autonomous demand was the most important growth engine for imports (+7.5 p.p.). On the contrary, the decrease in the wage share reduced them by 2.3 p.p. per year. The experiences of trade liberalisation (1976-1983 and 1991-2001) led to a process of desindustrialisation (Herrera Bartis, 2018), increasing the reliance on imported intermediate inputs, which impulsed imports by 1.2 p.p., and of imported capital goods (+0.7 p.p.). The change in the consumption bundle, where imported goods and services became more relevant, boosted imports by 0.7p.p. per year.

Between 1997 and 2004 we find the impact of the 2001-2002 crisis and its partial recovery, which is shown in the fact that autonomous spending reduced imports by 4.3 p.p. per year. The decrease in the wage share after the 2002 depreciation, when the exchange rate more than tripled, also reduced imports, by 1.2p.p. Conversely, the import propensity and the use of imported capital goods continued on the rise, increasing imports by 2.7 p.p. per year.

The crisis was followed by a robust economic recovery until 2011, based both on a stronger autonomous demand (with higher export prices but also increased government spending, which altogether boosted imports by 11.2 p.p. per year) and a substantial rise in real wages which improved income distribution, raising imports by 4.0 p.p. A higher share of consumption was spent on imported goods and services, raising imports by 1.3 p.p. Conversely, a lower reliance on imported intermediate and capital goods reduced imports by 2.1 p.p.

The high growth rates implied that imports grew significantly faster than exports did (18.0% and 11.6%), leading to a depletion of international reserves and exchange rate instability. As a result, between 2011 and 2018 the wage share fell, leading to a contraction in imports of 1.0 p.p. per year. Autonomous demand growth was also limited when compared to previous periods, raising imports only by 1.0 p.p. Conversely, a new increase in the share of imported inputs and capital goods boosted imports growth by 2.5 p.p. per year.

Therefore, in several periods of the Argentinian history, real wages took the brunt of adjustment when the balance of payments became unsustainable, through the typical structuralist mechanism: the lack of foreign currency forced exchange rate depreciations, which increased prices and reduced real wages, dampening consumption and imports.

But in the long run, income distribution played little role in the determination of imports and the sustainability of growth. On the contrary, we have seen that the main factors driving imports were, firstly, autonomous demand, followed by transformations in the productive structure and the consumption bundle. While government spending and exports drive, in the long run, economic growth and therefore determine imports, the "premature deindustrialisation" suffered by the Argentinian economy since 1975 led to higher requirements of imports per unit of output (for all purposes: consumption, investment, and domestic production) which reduced the

[15] The length of the period is due to the fact that, despite an input output matrix for 1984 was developed by the Ministry of Economics, it has not been recognised as an official statistical input by the government and lacks some important sections to be used for calculations, such as the wages and employment vectors and information on final imports (Capobianco, 2021).

margin for boosting long run growth through autonomous demand, but also for a higher wage share.

4. A CYCLICAL GROWTH PATTERN

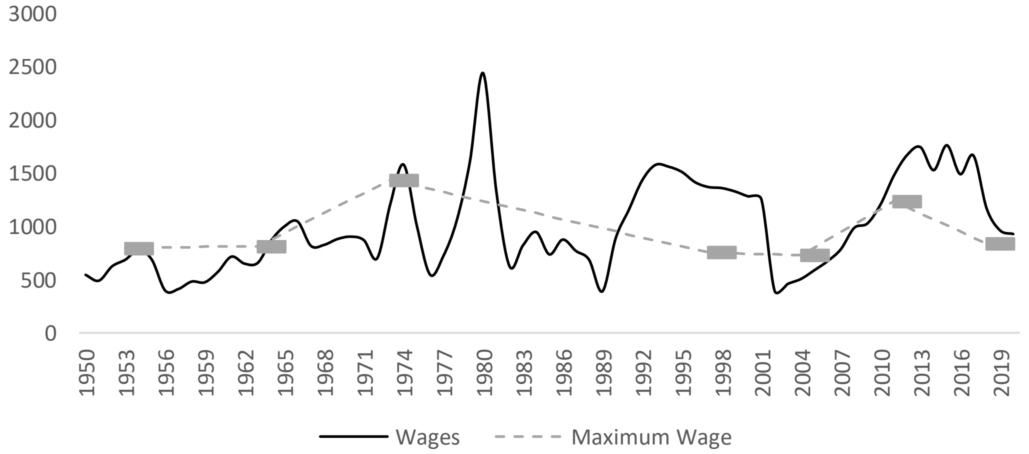
Canitrot (1983) argued that there is a maximum real wage in an open-economy compatible with trade balance equilibrium. Following Diamand (1985), this leads to a cyclical dynamic: if wages exceed their external equilibrium value, then the economy faces a BOT deficit, which erodes its international reserves and leads to a depreciation of the exchange rate. This, by increasing domestic prices, reduces real wages, depressing imports and restoring the trade balance. But if there is resistance to the depression of wages by trade unions, then real wages eventually will rise, opening a new cycle.

In section 2 we derived a formal expression for the maximum wage compatible with a balanced external position —see equation (2.17)— and in this section we calculate it empirically for Argentina with the help of its input-output matrices. This wage value is the one that would bring imports in line with exports, and therefore precludes the possibility of financing —at least temporarily— imports with international reserves and, more importantly, financial flows. The latter can ease the external constraint by providing foreign currency, but also tighten it by demanding it for interest and capital payments. Therefore, effective wages will not necessarily tend, at least in the short run, towards this "maximum" wage.

Figure 3 shows the maximum wage (the orange dotted line) and the real wage, both in constant 2020 dollars[16]. It can easily be seen that each time the effective wage reaches (or exceeds) its maximum value, this is eventually ensued by a decrease in salaries due to exchange rate depreciations: it is what happened in 1955, 1967, 1975, 1981, 2001 (although with a substantial lag, financed with debt and privatisation of public companies) and, finally, the adjustment undergoing currently, particularly since 2018.

Figure 3. Real and maximum wage

Argentina, 1950-2021, constant 2021 USD



Source: The author based on INDEC, CEPAL (1983) and Kidyba and Vega (2015)

[16] Values for the maximum real wage for the years can be calculated only for the years for which there is an available input-output matrix: 1953, 1963, 1973, 1997, 2004, 2011 and 2018.

But Figure 3 also shows how wage resistance comes into action: after depreciations and their toll on real wages, the latter tend to rise and recover, at least partially, their purchasing power: this capacity of the working class to transfer part of the price/exchange rate increases into their wages is what allows them to retain their part of the wage share but also what creates a price-wage spiral. There would therefore be, in the short run, a gap between the real wage demanded by workers and the maximum wage compatible with a balanced external position.

Note that the maximum wage has not remained unaltered during time but, on the contrary, it suffered significant fluctuations due to the factors mentioned in the previous section. The increased integration of the economic structure up to 1973 allowed for higher real wages since it led to stronger exports and reduced the import propensity of the economy. A similar tendency is observed in the 2004-2011 period, although in this case this is owed mostly to the increase in exports thanks to both an increase in exported quantities and very favourable international prices. On the contrary, the progressive disintegration of the domestic productive structure, which led to higher requirements of imports of intermediate, consumption and capital goods, reduced the maximum wage compatible with external equilibrium, reducing the margin for distributive conflict and therefore boosting inflation.

The fall in exports since 2011, due to lower international prices and a nil growth on exported quantities (CEPAL, 2021), has brought the external restriction again to the Argentinian economy, reducing real wages compatible with external equilibrium and accelerating inflation.

Therefore, our results support the hypothesis that the distributive conflict seems to have been a structural pattern in the Argentinian economy history, being the exchange rate and real wages the variable of adjustment that brings imports in line with exports. Given technology, higher real wages can only be supported with stronger exports, a more integrated productive structure or lower autonomous spending. But in the long run, autonomous demand is the main driver of imports, and exports need to grow at the same pace to allow for external equilibrium[17].

5. FINAL REMARKS

Structuralist authors have pointed to the lack of foreign currency as one of the main impediments for growth in Argentina. By limiting the access to imports, foreign currency not only imposes a constraint on output, but it also affects income distribution, reducing real wages with each exchange rate depreciation.

In this paper we built a model that decomposes imports growth with a structural decomposition analysis of a Sraffian supermultiplier model, in order to understand what its main determinants are. We found that, in the long run (1953-2018), imports grew at a similar pace than exports did, which is to be expected, given that the latter provide the foreign currency needed to finance the former. Our model also shows that the main long run determinant of imports is autonomous spending, being more important its domestic component rather than exports, due to the weight of the former in total demand in Argentina. Productive transformations also played a significant role driving imports: the relative disintegration of the productive structure initiated in the 70s

[17] Moreover, in the long run, increases in productivity are required to increase real wages, both by increasing output per worker and by boosting competitiveness and exports. However, higher productivity requires output growth, which can be inconsistent with external equilibrium (CEPAL-OIT, 2023).

had a lasting effect on imports growth, since it reduced domestic integration and increased the import coefficient in most activities.

On the contrary, income distribution did not play a significant role in the long run, but it did so in the short period. When high real wages led to balance of trade deficits, this was followed by depreciations that increased domestic prices, reducing real wages, consumption and imports. Therefore, the results of the Sraffian supermultiplier for output also holds for imports, being autonomous demand their main long run determinant, while income distribution affected output and imports levels but not their long run growth rate.

Our model also allowed us to estimate the maximum real wage compatible with the external restriction to growth. It grew between the fifties and 1973, due to a successful —although not unproblematic— process of import substitution, and since then it shows a decreasing tendency, only interrupted (partially) in the first decade of the 2000s. When real wages exceeded this value, they were followed by devaluations that brought wages back into equilibrium. Moreover, after suffering reductions, real wages tended to rebound, showing a process of wage resistance that adds an additional layer of complexity to the distributive struggle.

In summary, our results show that the availability of foreign currency imposes a constraint on Argentinian economic growth and income distribution, and it does so both in the short the run. While productive transformations that reduce the need for imported inputs could allow for a more equitable income distribution, in the long run it is necessary to increase export growth rates in order to allow for stronger and more equitable economic growth.

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7. ANNEX I. STRUCTURAL DECOMPOSITION OF IMPORTS WITH EXOGENOUS INVESTMENT

The assumption that all sectors have the same investment-output ratio is not necessarily a realistic one. This annex presents the results of an alternative structural decomposition exercise, where investment is treated as an exogenous, as a robustness check. This implies redefining the inverse Leontief matrix removing the effect of investment, adding investment to exogenous final demand, and considering imported final investment goods and services as final demand.

Therefore, we can define imports as:

$$\mathbf{e}^T\mathbf{m} = (\mathbf{a}_\mathbf{m}^T + \mathbf{a}_\mathbf{w}^T a_{cm})\mathbf{L}_\mathbf{w}\mathbf{L}_\mathbf{i}\mathbf{f}_\mathbf{Z} + m_{aut} \tag{8.1}$$

And perform the same decomposition as in the main text. The results are displayed in Table 3.

Table 3. Alternative decomposition of imports growth

Argentina, (1953-2018), constant 2021 USD, annualized growth rates

	1953-2018	1953-1963	1963-1973	1973-1997	1997-2004	2004-2011	2011-2018
Exports growth	7.2%	10.6%	7.6%	8.1%	3.4%	11.6%	-1.4%
Imports Growth	7.9%	10.9%	7.0%	10.3%	-4.0%	18.0%	-0.3%
Aut. domestic demand	3.6%	2.9%	4.9%	5.0%	-4.3%	8.7%	-0.1%
Exports	1.0%	0.8%	1.1%	1.1%	0.3%	2.0%	-0.1%
Import coefficient	0.9%	2.6%	-0.9%	1.2%	2.3%	-1.1%	1.9%
Technique	0.0%	0.0%	0.3%	-0.2%	0.4%	-0.2%	-0.1%
Income distribution	-0.1%	-1.1%	0.8%	-1.2%	-0.6%	2.6%	-0.4%
Imported cons. prop.	0.6%	0.3%	0.3%	0.7%	-0.1%	1.3%	-1.0%
Autonomous imports	1.9%	5.4%	0.6%	3.7%	-1.9%	4.7%	-0.5%

Source: The author based on INDEC, CEPAL (1983) and Kidyba and Vega (2015)

The alternative decomposition shows a more relevant role for autonomous imports, since now imported investment goods and services are considered as such. Consequently, the importance of other sources of import demand diminishes. However, the general results of the decomposition still apply. In the long run, autonomous demand still explains almost 60% of total import growth, boosting them by 4.6 p.p. annually, while income distribution reduced imports growth only by 0.1 p.p. per year. In the short run, income distribution still plays a relevant and oscillating role, affecting imports in a similar fashion than in the complete decomposition.