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Argentina's (Macroeconomic?) Trap: Some Insights from an Empirical Stock-Flow Consistent Model

by

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ABSTRACT

The Argentinean economy has just ended another lost decade. After the peak registered in 2011, the per capita GDP has oscillated with a decreasing trend, leaving the economy poorer than it was ten years before. During these ten years, different governments with conflicting macroeconomic programs were in power, none of them able to save the economy from stagflation. The goal of this paper is to address to what extent the economic performance would have been better had other policy combinations been implemented. The analysis is made through an empirical quarterly stock-flow consistent (SFC) model for the period 2007–19 in order to ensure the coherence of the results and to give the outcomes of the simulations a holistic and dynamically consistent interpretation. From the results of the simulations it seems that the problem that is keeping Argentina in stagflation goes beyond the domain of macroeconomics. The fact that in practice two divergent macroeconomic programs were implemented—neither of them being able to produce good and sustainable macroeconomic performance—is a first symptom that favors the case for that hypothesis. When the model is used to counterfactually test the policy recommendations of these approaches with the external conditions that prevailed while the opposite program was implemented, none of them yield results that can be deemed sustainable. Yet, the model developed in this paper can be useful for studying the different policy combinations that, given a specific context, can bring about more stable and sustainable dynamics for the Argentinean economy.

KEYWORDS: Stock-Flow Consistent Models; Argentina; Economic Policy

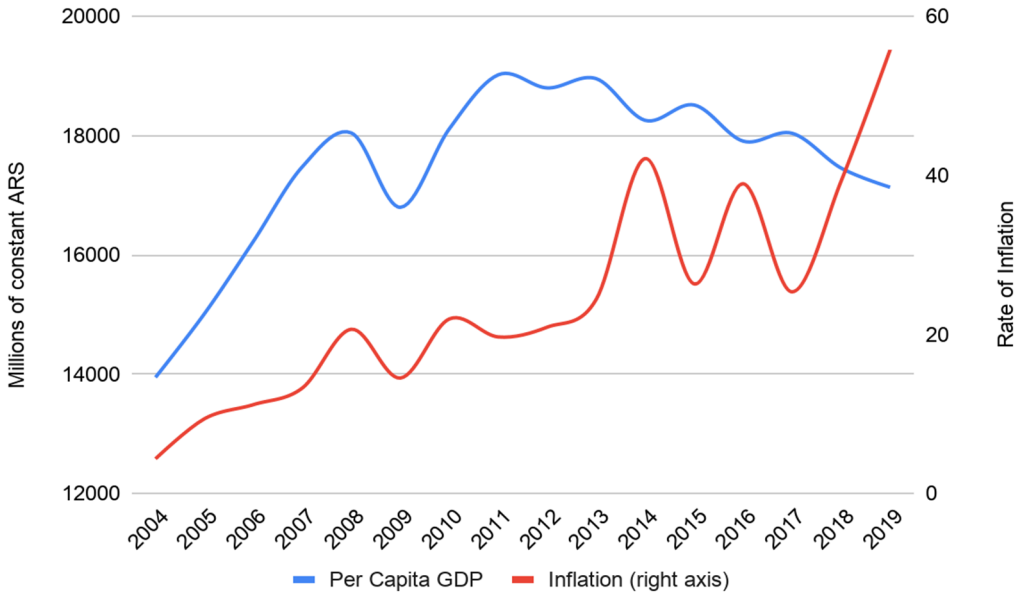
JEL CLASSIFICATIONS: C54; E17; E61; E65

1. INTRODUCTION

The Argentinean economy has just ended another lost decade. After the peak registered in 2011, the per capita GDP has oscillated with a decreasing trend, the fluctuations being mostly driven by the dynamics of the exchange rate[1] (figure 1). In parallel, the rate of inflation exhibited an accelerating trend that could only be contained when the nominal exchange rate was kept under control. The weak macroeconomic performance coincided with two antagonistic political regimes: while the second presidency of Cristina Fernández de Kirchner (2012–15) attempted to establish a "social Keynesian" wage-led regime of accumulation,[2] the administration of Mauricio Macri (2016–19) intended to lay the foundations of a finance-dominated accumulation regime[3] similar to the ones observed in the Pacific countries of the region, with Chile as the role model. From a theoretical standpoint it seems fair to associate the first model with Latin American structuralism and Post-Keynesian traditions—in the case of the second, the New Keynesian approach[4] seems to fit rather well. From a political perspective, the detractors of the former refer to it as a variant of populism, while the critics of the latter label it as *tout court* neoliberalism. The confrontation of these two models was a symptom of a deeper ideological contest that Argentinean society had been carrying on since the 1940s, though undermined through different means between the mid-1970s and the late 2000s. When it came to the surface in 2008 after a four-month crisis between the government and the agribusiness sector, the confrontation was so strong that it became part of the everyday life of most Argentineans thereafter.

[1] The years 2014, 2016, 2018, and 2019 were periods where sharp devaluations took place, mostly as a result of the impossibility of sustaining the nominal exchange rate at the prevailing levels.
[2] Chena et al. (2018) label this way the attempt to deploy a set of policies that strengthened real disposable income—the main driver of private consumption—in a context where the wage bill could not grow any longer.
[3] The notion of a finance-dominated regime of accumulation was not proposed by the government, but is a characterization based on the similarities between the orientation of the policies that were actually implemented and the features of the finance-dominated regimen as defined by Hein and Van Treek (2010) and Hein (2012). Among the main features of this regime, they distinguish a worsening of income distribution, higher household indebtedness to finance consumption, increasing shareholder power in the investment decision, and the liberalization of capital markets.
[4] By the New Keynesian approach, we are referring to the theoretical framework underlying the inflation targeting regime. For a critical discussion about this framework, see Arestis and Sawyer (2008).

Figure 1. Per Capita GDP and Inflation



Source: Own elaboration from the data published by National Institute of Statistics and Surveys (INDEC).

From a Regulation Theory perspective, the failure of these two different macroeconomic models suggests that either they were internally inconsistent at the level of the institutions,[5] thereby becoming unstable or, being institutionally consistent, they failed to achieve a coherent relation with the features of the underlying structure or with the external context of their time. The combination of these two possibilities is, however, the most likely explanation for the fact that in the beginning of the 2020s, Argentina is poorer than it was ten years before. With the advantage of hindsight, this paper examines to what extent the performance of the economy would have been better had other policy combinations (i.e., a different institutional arrangement) been implemented. The analysis is made through an empirical stock-flow consistent (SFC) model in order to ensure the coherence of the results and to give the outcomes of the simulations a holistic and dynamically consistent interpretation. The model is built on a quarterly basis for the period 2007–19 and used to address four questions, two of them regarding the 2012–15 period and the other two focused on the 2016–19 interval. In the four

[5] For the French Regulation Theory school, institutions are devices through which the conflicts that are inherent in any society are (temporarily) stabilized. Economic policy instruments such as the rate of interest, various tax rates, labor institutions, exchange rate, trade policy, capital controls, etc., are, from this perspective, tools through which specific goals can be pursued, but always keeping in mind that the they have a nonneutral effect on the founding conflict upon which any society is built.

cases the questions attempt to propose alternative policy combinations to the ones that were actually implemented.

The paper is organized as follows. After this introduction, a brief description of Argentina's recent macroeconomic history is presented. In section 3, there is a presentation of different interpretations to the facts described in section 2. These interpretations are useful to derive the research questions that are addressed by means of the model described in sections 4 and 5. In section 4 we define the matrices upon which the model is built; the data sources and the methodology for obtaining the "missing variables" are also presented. Section 5 specifies the system of difference equations that define the model conceptually designed in section 4. In section 6, the model is used to tackle the four research questions posed in section 3. Finally, the study's main conclusions are presented.

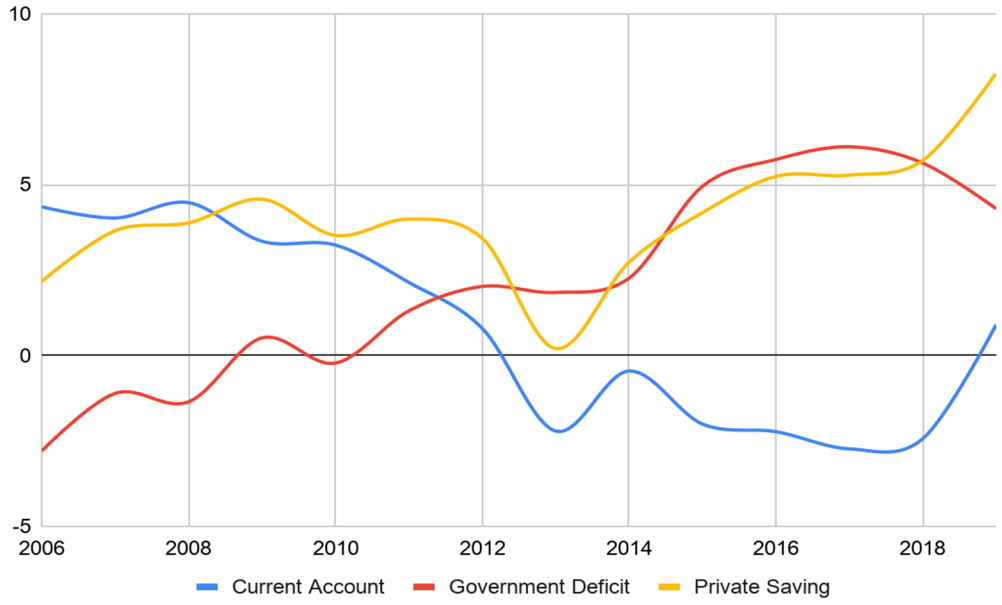
2. HISTORICAL CONTEXT

In December 2001, Argentina suffered the worst economic crisis in its entire history.[6] The currency board regime, which had successfully ended the hyperinflation of the late 1980s, was going through a slow death. The commercial openness of the economic regime combined with the real exchange rate appreciation led to a persistent current account deficit that could only be financed with external indebtedness. External finance became harder to find as other emergent economies were hit by the crises that followed the outbreak in South East Asia in 1997. The sustainability indicators of Argentina did not show a promising outlook either. After three years of recession and massive increases in the unemployment and poverty rates, the currency board exploded in January 2002. As a result of the regime switch, which came along with a change in the government,[7] the external debt was defaulted on and the nominal exchange rate, although initially depreciated by 40 percent, ended up suffering a 280 percent devaluation in only six months. In 2002, GDP contracted by 10.9 percent.

[6] At the moment of writing this paper, the effects of the quarantine implemented in the context of the COVID-19 pandemic seem to be even worse than those registered in 2001.
[7] President Fernando De La Rúa resigned after 39 persons were killed by the police in the riots that took place in Buenos Aires. After ten days where three different persons temporarily took up the presidency, Eduardo Duhalde was finally chosen by the legislature to finish De La Rúa's mandate.

The abandonment of the currency board gave the economy much more breathing space. The combination of a floating and competitive real exchange rate with the relief that the default implied in terms of external debt servicing laid the foundations for a process of high growth rates. The Néstor Kirchner administration (2003–07) could deploy expansionary policies to restore the levels of consumption that prevailed before the long recession of the 1990s. Private employment recovered and the real wage was strengthened, thereby improving income distribution. A depreciating US dollar derived from the expansionary policies of the US Federal Reserve contributed to maintaining the real exchange rate at competitive levels despite the continuous increases in the real wage. Investment gradually increased as utilization levels approached the "normal" rates and expectations were optimistic, which was not surprising taking into account that the economy was growing at rates around 8 percent. From the financial balances of the three aggregate sectors of the economy (figure 2) it is observed that the economy was making up lost ground in a seemingly sustainable manner, since the high growth rates were being attained together with the "twin surpluses" (government and external), while the private sector was net saving.

Figure 2. Financial Balances (as a percentage of GDP)



Source: Own elaboration from the data published by INDEC.

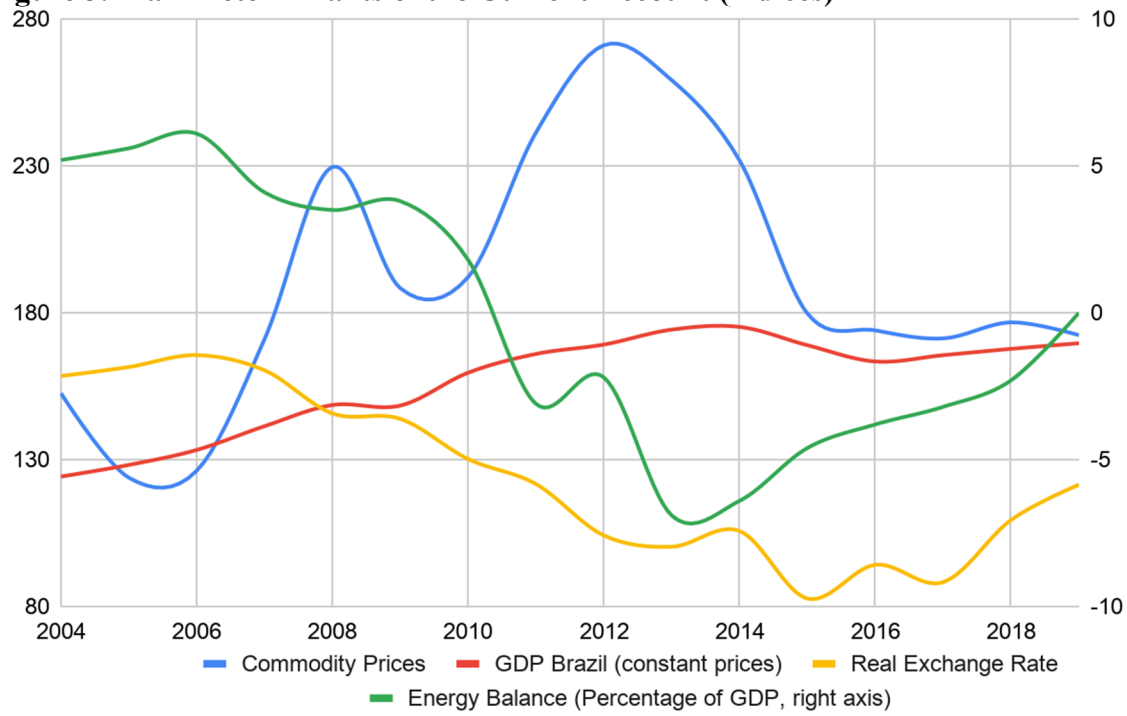
These virtuous dynamics were suddenly interrupted by the global financial crisis (GFC). Although Argentina quickly recovered from the shock, the sustainability of the growth regime (as interpreted from the evolution of the financial balances) was put in jeopardy. The current account started to worsen continuously and hit a 2 percent deficit-to-GDP ratio in 2013. Although under normal conditions a deficit of this size should have not found difficulties in obtaining external financing sources, these were not available for Argentina, allegedly due to the government's contentious approach to global financial markets and an unsolved conflict with "holdout" creditors.[8] When the Macri administration took office it quickly solved these pending issues with the "vulture funds," thereby gaining access to global financial markets. The result was not only a persistent current account deficit (now hidden by the easy access to external credit) but also an unsustainable process of external indebtedness. In any case, since the private sector's financial balance tends to be rather constant all over the sample, the behavior of the current account is mirrored by the financial balance of the government, though with no necessary a priori order of causation. It seems clear, however, that following the GFC, either the configuration of Argentina's regime of accumulation or the external context changed significantly, leading to an unsustainable path that would eventually end up in a lost decade.

In order to gain some insight into the dynamics of the financial balances it is useful to portray some of their main determinants. From figure 3 it is possible to infer a high correlation between the energy trade balance and the current account deployed in figure 2. The worsening of the energy trade balance follows unsolved structural bottlenecks in the supply side, which eventually impose constraints to the economy's rate of growth unless the scarcity of energy is compensated for with imports. This structural limitation, which can only be overcome with investment, was aggravated by a combination of exogenous forces. First, the main trading partner, Brazil, entered a stagnation that resulted in a process of high political uncertainty that (eventually) fed back into the economy. Second, the commodity supercycle ended, leaving export prices at half of their peak levels. Third, the real exchange rate started to appreciate as inflation accelerated from 2007 onwards, leading to increasing imports of goods and services until capital controls and nontariff barriers were imposed in 2012 (until 2015). The acceleration

[8] The conflict arose as a result of a group of the so-called "vulture funds," who did not accept the debt restructuring proposed by Argentina in 2005 and decided to take the case to the courts in New York. In 2012, Judge Griesa found in favor of the creditors. For a brief timeline of the Argentina's conflict with these hedge funds, see Moyer (2016).

of inflation, the determinants of which are estimated in the model presented in section 5, is of utmost importance since the policy combinations of the two periods of analysis (2012–15 and 2016–19) are ultimately different attempts to solve the same problem: an increasing inflation rate (that went from 8.4 percent in 2007 to 53.8 percent in 2019) that was generating multiple disequilibria in the economy.

Figure 3. Main Determinants of the Current Account (indices)



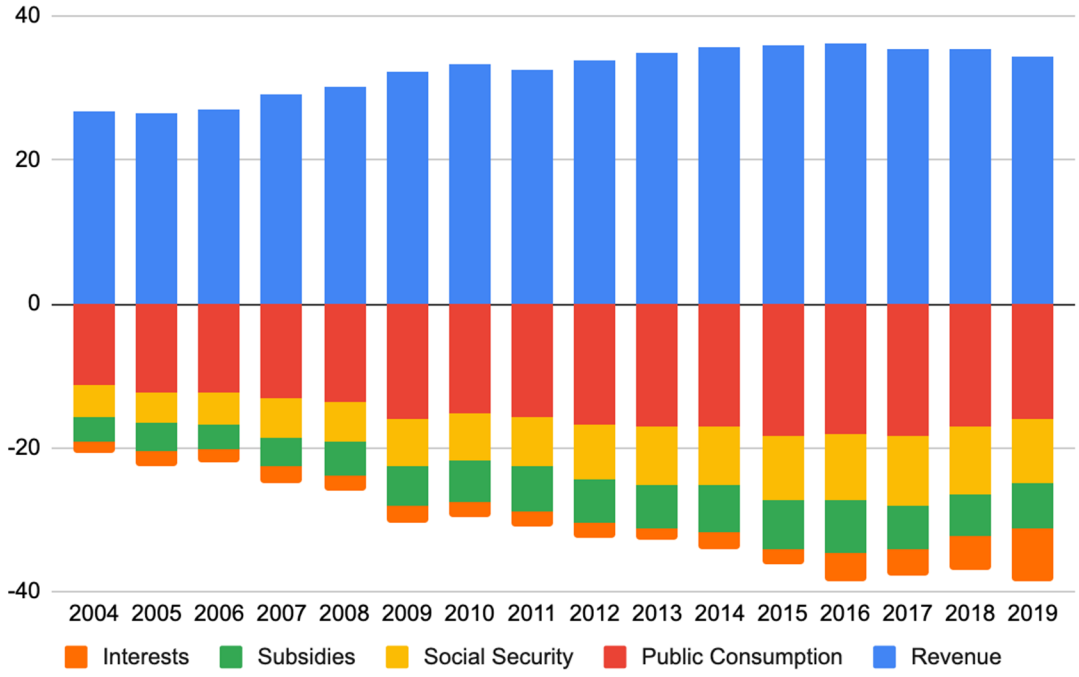
Source: Own elaboration from the data published by INDEC, Brazilian Institute of Geography and Statistics (IBGE), and the International Monetary Fund (IMF).

Unlike the current account, whose dynamics were mostly explained by structural or external factors, the changes observed in the government's financial balance were naturally driven by policy decisions or, eventually, automatic reactions to shocks in other spheres of the economy (i.e., institutional devices that are still policy decisions, although not necessarily easily modifiable).[9] Figure 4 exhibits the main components of the general government budget balance. The first conclusion that is drawn is that from 2004 to 2019, the government almost doubled its size (measured as the total expenditures divided by nominal GDP). Although all the components

[9] Some examples of these institutional devices that automatically adjust to changes in other parts of the economy are cash transfers to low-income households and informal workers, nominal pensions for retirees, and subsidies to energy production.

increased, the larger size of the public sector seems to be explained by a larger social security network[10] and a policy oriented to regulate some of the economy's key prices (mainly electricity, gas, and public transportation), which is captured under the "subsidies" account. From 2011, the increase in public employment (included in public consumption) was also important. The interest payments account started to contribute more significantly to public spending in 2016, when the process of indebtedness was initiated during the Macri administration. From figure 4 it is clear that although government revenue increased over the sample period, it did so more weakly than expenditures, thereby resulting in the negative financial balance portrayed in figure 2.

Figure 4. Main Components of the Government Balance (as a percentage of GDP)



Source: Own elaboration from the data published by INDEC.

Figure 2 shows that even though there were major changes in the financial balances of the public and external sectors over the period of analysis, the private sector balance tended to oscillate around a surplus of 2 percent of GDP with no major deviations (with the exception of the year of the GFC and 2019). As the SFC tradition points out, the fact that a sector is saving

[10] During the government of Néstor Kirchner (2003–7) and Cristina Fernández de Kirchner (2007–15) there was a remarkable policy of enhanced rights, among which the full pension coverage and child allowance for informal workers stand out.

implies that it is accumulating wealth. The flow-of-funds matrix describes the form that this wealth accumulation takes. On the contrary, for those sectors with a negative financial balance (i.e., a deficit) the flow-of-funds shows by means of which liabilities the deficits are being financed. These stock-flow relations are important because the form under which a certain sector accumulates its wealth or finances its deficits is not neutral. Of special importance are the currency denomination, maturity, and liquidity of these assets.

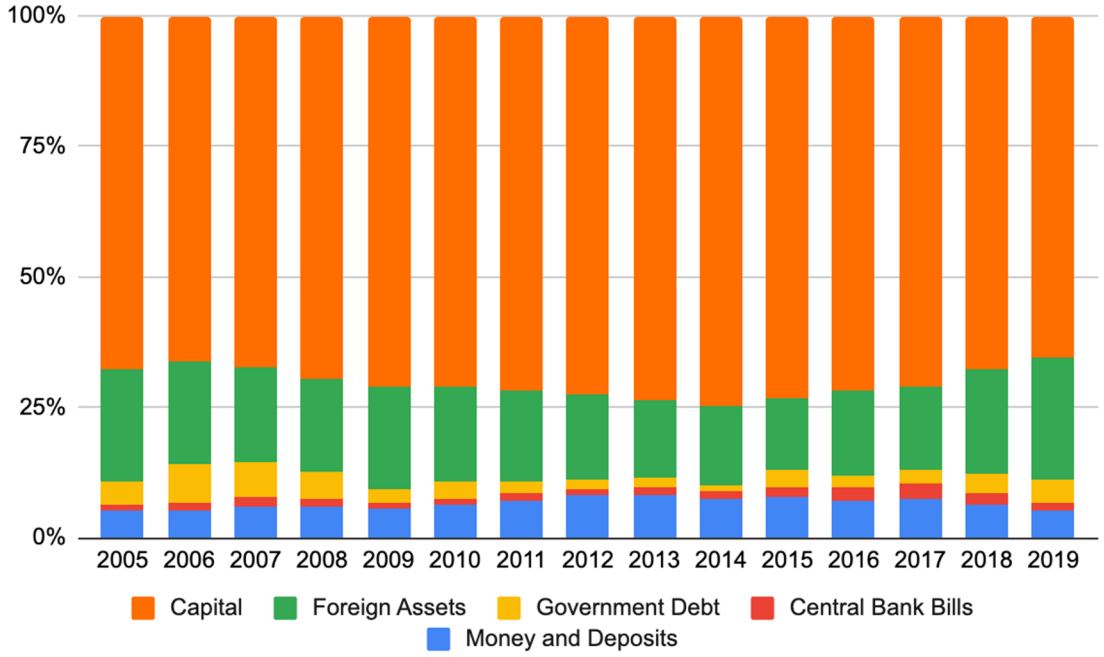
In order to analyze the private sector's balance sheet,[11] which is illustrated in figure 5, it should be borne in mind that when inflation started to accelerate, the Fernández de Kirchner government, not sympathetic to the inflation targeting framework, did not take the mainstream proposition of increasing the interest rate. This progressively translated into a negative real interest rate that made domestic financial assets less attractive. In order to prevent this from translating into a strong demand for foreign assets, strict limitations to the acquisition of foreign exchange were imposed. It should also be noted that once the Macri administration took office these controls were removed, and the central bank switched to a regime of positive real interest rates. Given the high inflation rates during those years (while inflation was standing at 25 percent in 2015 before Macri took office, in 2016 inflation reached 44 percent) even the high nominal interest rates established by Argentina's central bank were insufficient for achieving a positive real interest rate target.

From the analysis in figure 5 the following features stand out. First, fixed capital is by far the largest component of the balance sheet. Second, capital seems to have increased its share in the balance sheet until 2014. Thenceforth, it lost ground against foreign assets, government debt, and central bank bills, a rather expected behavior in a financialized institutional setting. Third, taking the financial component of the balance sheet, foreign assets are the dominant form of wealth accumulation. This signals one of Argentina's historical structural weaknesses: the lack of a secure and sound instrument for preserving wealth. Fourth, after a reduction in the stock of government debt and central bank bills held by the private sector, they started to increase from 2015 onwards. The evolution of the composition of the balance sheet seems to be tied to the government's approach to the problem of inflation and to the type of regulation on the domestic

[11] Since Argentina has no official flow-of-funds matrix, the model presented in this paper attempts to construct a simplified version of this statistical instrument appealing to different data sources. For further details, see section 4.

financial market: the share of fixed capital tends to increase while there are controls on the acquisition of foreign exchange and real interest rates are negative, while the share of foreign assets tends to increase whenever it is possible to acquire them, and the purchase of domestic bonds and bills seems to be related to the their real rates of return.

Figure 5. Main Components of the Private Sector's Assets (as a percentage of total assets)



Source: Own elaboration from the data published by INDEC.

From all these facts it is important to draw two important conclusions. First, if the private sector tends to run surpluses and the dominant form of accumulating financial wealth is the acquisition of foreign assets, private surpluses can be destabilizing because they can lead to present or future tensions in the balance of payments. The tensions will be contemporaneous if the demand for foreign exchange cannot be met by a trade surplus of capital inflows; the tensions will be transferred to the future if the current demand for foreign exchange is successfully met with an increase in indebtedness. Second, if the attempt to prevent the private sector from demanding foreign exchange entails the issuance of short-term assets with high interest rates (as the central bank bills issued in the period 2016–19), this can lead to a snowball effect of cumulative interest payments that are capitalized under the form of the acquisition of new assets. Once these short-term assets reach maturity they have to be rolled over, creating an unsustainable spiral that

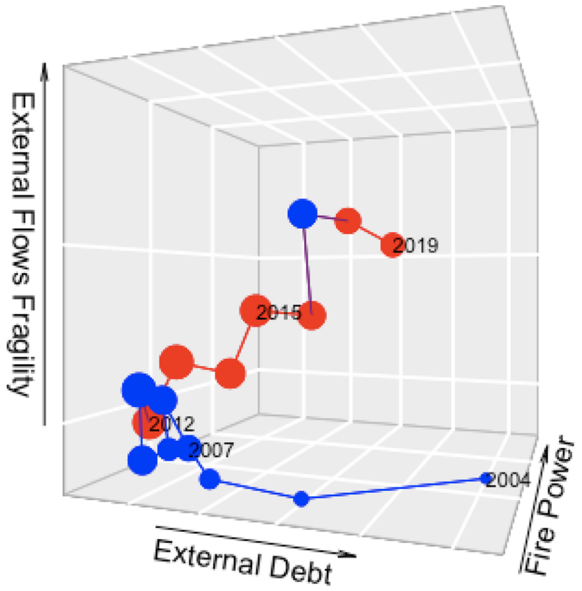
ultimately puts the balance of payments under pressure through the channel of the acquisition foreign assets.

Thus, to achieve financial and macroeconomic stability it is necessary to provide the private sector with wealth accumulation forms that do not put the balance of payments in jeopardy. The importance of the increasing inflation rate in the whole period of analysis and the different attempts to reduce it is strongly related to the private sector's portfolio decisions—as long as there is no medium-term asset denominated in domestic currency that is deemed capable of delivering a positive return (in real terms and, taking into account the Argentinean mindset, in dollars as well) it will be hard for any growth regime, right-wing or left-wing, to attain macroeconomic sustainability.

The preceding description of Argentina's macroeconomic performance can be summarized in the six-dimensional diagram portrayed in figure 6. The first dimension is the external flows fragility, which measures the capacity of the economy to meet its demand for foreign exchange.[12] The higher the economy is placed in this dimension, the higher the excess demand for foreign exchange. The second dimension is the external debt (as a percentage of GDP). The higher (lower) the external debt, the more (less) room there is available for financing a balance of payments deficit through the issuance of more debt. The third dimension is the firepower of the central bank to counter a run against the domestic currency.[13] It should be borne in mind that the firepower is inversely plotted in the diagram: the higher we move along the axis, the lower the firepower of the central bank (because it represents a higher ratio of short-term debt to foreign reserves). From the presentation of the first three dimensions it is deduced that the economy is safer the closer it is to the bottom-left-front vertex of the box. The more it departs from that point and, more specifically, the closer it gets to the top-right-back vertex, the higher its overall external vulnerability.

[12] The index of external flows fragility is given by the ratio of the sum of imports, interest payments, and net acquisition of foreign exchange (total demand for foreign exchange) to exports (supply of foreign exchange).
[13] The firepower index is given by the ratio of short-term liquid debt (mostly money, deposits, and central bank bills) to the foreign reserves held by the central bank.

Figure 6. External Vulnerability



Source: Own elaboration.

The fourth dimension of the diagram is given by the size of the economy, approximated through per capita GDP and represented by the size of the dot. The fifth dimension simply represents the years where the economy suffered a crisis, defined as a situation where either the nominal exchange rate suffered a discontinuous devaluation or the central bank had to impose strong capital outflow controls to prevent those devaluations from triggering. The sixth dimension is time.

In 2004, the Argentinean economy was relatively small in size and was hugely indebted (although in a situation of default). However, this constraint did not prevent it from recovering from the 1999–2002 crisis because it had a foreign exchange surplus (very low position in the external flows fragility plane), which resulted in an increase in the central bank's firepower (very low position in the firepower plane). Between 2005 and 2006, the external debt was sharply reduced thanks to a restructuring process and the early cancellation of the debt with the IMF. As the economy grew all the way to the year 2008, the foreign exchange surplus started to vanish, mainly driven by the acquisition of foreign assets by the private sector. This could have been taken as a first warning message. The GFC temporarily interrupted this seemingly unsustainable behavior, which was restored when the economy recovered in 2010 and 2011. Strikingly, the economy suffered a balance of payments crisis in 2012, having a low current

account deficit, very low levels of external indebtedness, and a relatively high level of central bank firepower. Regardless of the low levels of indebtedness, the government chose not to appeal to external financing. With this policy decision in mind and knowing that the central bank's firepower was finite, the leakage of foreign exchange was stopped by establishing tight capital controls.

Although from 2012 to 2015 capital controls were effective at reducing (almost to zero) the demand for foreign assets, the foreign exchange deficit increased due to the current account deficit.[14] At the same time, the firepower of the central bank was diminishing because in order to keep the parallel market of foreign exchange (a usual outcome when tight controls are established) still required some sales of foreign reserves. The government's agreements with other central banks to provide some foreign exchange[15] (reflected in the slight increase in the external debt) were not sufficient to rescue the economy from the crisis. They were enough, instead, to maintain an institutional setting that left the economy with a historically high level of income, although in a clearly unsustainable position on the external front.

The story during the Macri administration was similar to the ones previously observed in other experiences of governments with the same political orientation, both in Argentina and Latin America: the government undertook a massive liberalization of the economy that resulted in a very fast increase in foreign indebtedness. This coincided with the worsening of the current account (also driven by the liberalization of trade flows) and a huge increase in the acquisition of foreign assets by the private sector (this is observed in the jump along the external flows fragility plane in figure 6). In order to attract foreign financial capital and to undermine the leak of foreign exchange, the central bank increased the issuance of short-term bills paying high interest rates. The dream world would only last two years. In 2018, global financial markets interpreted that Argentina's model was not sustainable and ceased lending to the country. The

[14] The effectiveness of capital controls at reducing the acquisition of foreign assets should not be interpreted as a successful policy, since the byproduct was a growing gap between the official and parallel exchange rates and a series of incentives misalignments. For instance, exporters were encouraged to underinvoice their transactions to avoid liquidating the proceeds of their exports at the official (low) rate. Importers, for their part, were encouraged to overinvoice their purchases to acquire foreign exchange at the official rate (cheaper compared to the parallel rate).

[15] For instance, in 2014, the central bank agreed with the People's Bank of China on a currency swap equivalent to 11 billion US dollars.

central bank had to start liquidating its firepower, which was insufficient to prevent two devaluations in a matter of months. A major collapse could only be prevented by appealing to the IMF, which gave Argentina the largest bail-out in its entire history (57 billion USD). In a little more than a year, however, the IMF also convinced itself about the unsustainability of Argentina's trajectory and decided not to disburse the last installment of the stand-by agreement. Devoid of any form of financing, suffering a continuous leak of foreign exchange, and with almost no more central bank firepower, Macri lost the elections and left power, defaulting on the internal debt and reestablishing the capital controls whose removal had made up its main campaign slogan.

When Alberto Fernández took office on December 10, 2019, the economy was the size it was in 2007 but with an inflation rate of 53 percent, a balance of payments crisis, a massive external debt with a maturity asymmetrically concentrated in the next few years, and almost no foreign reserves at the central bank. Moreover, the Obama times of international cooperation and the commodity boom were over. The COVID-19 pandemic was just breaking out. Another lost decade had been written in Argentina's history.

3. THE MACROECONOMIC DECLINE OF ARGENTINA: ALTERNATIVE INTERPRETATIONS

In this section we present alternative interpretations of Argentina's macroeconomic performance during the 2010s. These contending visions are used to pose the research questions that will be addressed through the model developed in the next two sections.

From the description of Argentina's main variables, it is clear that after the recovery from the GFC the economy took an unsustainable growth path. From a Regulation Theory perspective, Chena et al. (2018,18) describe this period as an "externally constrained social Keynesianism," namely, a regime where: i) the main growth engine was private consumption[16] but, instead of

[16] According to Chena et al. (2018, 7) the whole period governed by the Kirchners was driven by private consumption (wage-led growth) because it is not possible for an economy with an underdeveloped capital goods production sector to be driven by investment (profit-led growth). Moreover, they argue that if the production

being driven by growth in employment it was pushed by the increase in public social spending and; ii) a series of difficulties, both internal and external, whose result was a scarcity of foreign exchange that eventually put an upper limit to the rate of growth of GDP.

Until 2011 the main explanatory variable of the growth in private consumption was the increase in the real wage bill, which was in turn driven by the growth in private employment and the increase in the real wage. These dynamics seem to have reached a limit at this point, beyond which they could no longer be sustained. Not being able to switch to a regime of accumulation where the economy was sustainably pushed by investment (given its high negative impact on the trade balance) or exports (given the composition of the export basket), the government had no choice but to take the central position in the hierarchy of institutionalized forms. In practice, this implied the implementation of an income redistribution policy based on the strengthening of the social security network and the regulation of some of the key prices in the economy, mainly utilities. By keeping inflation lower than in a context of no price regulation it was possible to protect the real wage (in order to keep consumption driving aggregate demand) and to avoid a further real exchange rate appreciation, which would have ended up putting even more pressure on the nominal exchange rate and, therefore, on the whole viability of the process.

Another key element that Chena et al. (2018, 35) identify in characterizing the 2011–15 period as a regime of accumulation where finance was subordinated to the wage-labor nexus and the State adopted a leading place is the establishment of a null or even negative real interest rate. This policy was oriented to bolster consumption and to promote investment in productive rather financial capital. But in practice the result was the fueling of the mounting pressures on the exchange rate, which came from the deterioration of the trade balance and the political tensions that arose from a series of conflicts between the government and the private sector, both local and foreign. Simultaneously, the wage-price spiral persisted, as neither unions nor firms gave in. At the end of the day, the persistence of inflation made it even harder to cope with the external constraint in a context where the government opted for a fine-tuning policy rather than a traditional adjustment through a contractionary devaluation among the lines described by Díaz-

structure is not sufficiently diversified it is unlikely that net exports can make up a growth engine (export-led growth). The competitive real exchange rate registered in the 2000s has to be seen as a condition of possibility but not as the main growth driver.

Alejandro (1963) and Krugman and Taylor (1978). The fine-tuning policy implied, in the external dimension, the establishment of quantitative restrictions on the acquisition of foreign exchange and import quotas. That is how the externally constrained social Keynesianism model was closed, keeping aggregate demand and employment at historically high levels but with growing tensions on the macro-financial front.

The regulation mode adopted in the 2011–15 period had, broadly speaking, two types of critiques coming from two different theoretical strands. On one side, there was the critique from the representatives of the mainstream who, with the New Keynesian model in mind, argued that there was a problem of fiscal dominance and an underestimation of the effects of inflation, which was also being tackled mistakenly. A reference to the New Keynesian critique to the structuralist Post-Keynesian model that was in place until 2015 can be found in Sturzenegger (2019)[17]when he describes not only the model that was in mind of the government that would take power in December 2015 (note that the title of his paper is "Macri's Macro") but also the initial conditions on which it had to be based. On the other side, there was the critique from the new developmentalism strand, mainly focused on the need to establish a real exchange rate that allowed the technically efficient sectors to compete in global markets. A representation of this view can be found in Rapetti (2013) and Gerchunoff and Rapetti (2016), who argue that the increases in the real wage were possible until the GFC because the US dollar was depreciating worldwide, but when conditions changed in the aftermath it would have been wiser to allow the nominal exchange rate to depreciate or to borrow from abroad instead of establishing import quotas and capital outflow controls.

From a New Keynesian perspective, expansionary fiscal policies take output beyond its natural level, thereby inducing upward pressures on the rate of inflation. An inflation targeting framework, provided that aggregate demand is sensitive enough to the changes in the interest rate, should take output back to its natural level, thereby eliminating inflationary pressures. The

[17] The reference to Sturzenegger is not a minor detail, since he was not only one President Macri's most important advisors but also the governor of the Central Bank of Argentina from December 2015 until June 2018. During his mandate he attempted to establish an inflation-targeting monetary policy framework, along the lines proposed in the New Keynesian model. After failing at reducing inflation (Sturzenegger himself explains the mistakes that his administration and the Treasury made in the process), the inflation targeting framework was abandoned in September 2018.

strong commitment of the monetary authority to pursue the inflation target should also align (forward-looking) inflation expectations around the target. From Sturzenegger's narrative about the planning of the adjustment program in case Macri won the 2015 elections it seems clear that reducing the fiscal deficit was the main goal. Taking into account political criteria, the decision was to make the fiscal adjustment gradually, which implied taking debt on global markets (Sturzenegger 2019, 6). The fiscal adjustment would be combined with the removal of the quantitative restrictions on the acquisition of foreign exchange (for both commercial and financial motives) and with the establishment of a floating exchange rate. In the description of the vision of Macri's economic cabinet that Sturzenegger expresses, it is possible to find the main critiques to the structuralist Post-Keynesian model undertaken by the Kirchners.[18]

For its part, the New Developmentalist model proposed by Gerchunoff and Rapetti (2016) acknowledges that inflation had an important conflicting claims component. Based on theoretical contributions that combine elements of the Latin American structuralism,[19] Post-Keynesianism,[20] and neoclassical economics,[21] they build a system for the real exchange rate (which is a function of the wage and the nominal exchange rate, in the case of the former because it is part of the price equations of nontradable goods, in the case of the latter because it is one of the key determinants of the price of tradable goods) and an exogenous policy variable that is positively related to the level of absorption (changes in this policy variable increase absorption). They derive a single equilibrium that they call the "macroeconomic equilibrium real exchange rate," which is the level of the exchange rate such that given the exogenous policy variable of the model the economy meets both the internal and external equilibrium. The internal equilibrium is given by all the combinations of the real exchange rate and policy variables that yield full employment. The external equilibrium is the one that meets the balance

[18] "The team also argued that it would be easier to build credibility by using a framework that was mainstream, in line with the idea of the normalization of Argentina. This was basically also the reason why the use of incomes policies were discarded, though other arguments were that the government did not want to sit 'the old-politics' players at the decision table and that utility price adjustments would take a long time. Additionally, income policies would seem similar to some of the policies implemented by the previous administration with which the current administration wanted to provide a clean distinction" (Sturzenegger 2019, 11).

[19] Mainly the description of a multisector economy, each of them bearing specific features regarding production techniques, input requirements, and productivity.

[20] For instance, there is an explicit reference to Rowthorn (1977), which is at the core of the Post-Keynesian theory of inflation.

[21] They assume that the tradable good is produced using a Cobb-Douglass production function, which implies that the demand for labor automatically adjusts to changes in the wage.

of payments equilibrium, defined as a situation where the current account balance can be financed by a "normal" or "long-term" financial inflow. Additionally, they define an ad hoc equilibrium, which they call the "social equilibrium real exchange rate," which is the one that not only yields full employment but also the income distribution desired by workers. The key conclusion of their analysis, which is applied to the period 1930–2015, is that as a result of the historical processes that resulted in the strengthening of labor institutions and taking into account Argentina's production structure, the social equilibrium tends to imply a lower (more appreciated) real exchange rate than the macroeconomic equilibrium, thereby leading to what they call a "structural distributive conflict" (Gerchunoff and Rapetti 2016, 228).

From the New Developmentalist point of view, the period before the GFC was rather extraordinary because the international depreciation of the US dollar allowed Argentina to simultaneously attain an increasing real wage and real exchange rate, at the time that high commodity prices made the external constraint nonbinding. However, in the aftermath of the crisis, Argentina was situated in the internal equilibrium (private employment was historically high), probably close to the social equilibrium (the real wage had been increasing for several years), but had departed from the external equilibrium (the real exchange rate had appreciated as the US dollar started to rise and inflation accelerated in Argentina). According to the New Developmentalist model, the restoration of the macroeconomic equilibrium required both a devaluation and a less-expansionary fiscal policy.[22] Such a movement would have implied, however, a departure from the close-to-the-social-equilibrium position in which the economy stood around 2010–11.

To sum up, there are two main alternative paths that, according to these theoretical approaches, the economy could have taken after the GFC. First, a radical change in the approach to the problem of inflation, which could have consisted of a fiscal tightening, a more restrictive

[22] Dvoskin, Feldman, and Ianni (2020) show that the relationship between the real exchange rate depreciation and the increase in employment that the restoration of the macroeconomic equilibrium would have required relies on the assumption that the production function of the tradable good follows a perfect substitutes form and on the fact that the internationally competing tradable good is a manufactured good whose labor intensity is higher than the one of an alternative primary tradable good. Also, when the contractionary effect of the devaluation is considered, the model requires that the excess production of the tradable good is automatically absorbed by exports. If these assumptions do not hold, the channels that New Developmentalism identifies for establishing a positive relationship between competitive exchange rates and economic growth no longer hold.

monetary policy, and/or a fully floating exchange rate—alternatively, the pursuit of a stable real exchange rate at competitive levels with a less expansionary fiscal policy. What the two proposals share is the rejection of the quantitative controls on the acquisition of foreign exchange for both commercial and financial transactions. Thus, from these two critiques, we derive two research questions to be addressed by means of the model presented in the next section.

The plan implemented during the Macri administration intended, as Sturzenegger (2019) explains, to conduct macroeconomic policy following a more mainstream approach. The main pillars of the plan were: i) removal of the capital controls and establishment of a floating exchange rate regime; ii) gradual reduction of the fiscal deficit, mainly through the removal of the subsidies on utilities; iii) establishment of a tight monetary policy that would converge to an inflation targeting framework with no other anchor than the central bank's credibility; and iv) regularization of Argentina's conflict with the holdouts, which was keeping the country unable to obtain funding in the global markets. As the capital controls were progressively removed[23] there was a surge in capital inflows, which benefited from spectacular profits (the nominal interest rate was above 30 percent and the nominal exchange rate was stable, thanks to the massive inflows). The result of these inflows, particularly those arising from the rise in the public external debt, was an increase in foreign reserves. The monetary expansion derived from this process had to be sterilized, implying a rise in central bank short-term liabilities whose maturity, according to Sturzenegger, they tried to lengthen by increasing the longer rates with relative success. Although the central bank considered that monetary policy was successful as core inflation was declining, the regular increases in the prices of utilities (as the government was reducing the subsidies in order to converge to a balanced budget) forced it to keep up with the monetary tightening.

The internal critiques to the plan as implemented can be taken from Sturzenegger's analysis. Sturzenegger argues that the central bank misread the market signals more than once, even during his own administration, when the absorption of an important part of the monetary base at

[23] In January 2017, the Treasury decided to lift the only requirement that was left, which obliged foreign financial capital to stay in the country for at least four months. The removal of this requirement implied that foreign capital could enter and leave the country in a matter of hours.

decreasing (but high, of the order of 35 percent) interest rates was taken as an increase in the market's credibility on the monetary policy framework. In hindsight, he argues that monetary policy should have been tighter even when it seemed to be delivering satisfactory results (Sturzenegger 2019, 10). Moreover, Sturzenegger (2019, 18) recognizes the tensions inside the economic cabinet when he stresses that the tight monetary policy was resisted by the Treasury, which advocated for a looser approach to boost the economy, to the extent that he concludes that "the government showed significant procrastination in the fiscal front, even through 2018" (Sturzenegger 2019, 25). Also, he claims that the partial success of the disinflation policy was putting pressure on the fiscal accounts because half of the public spending was backward indexed: "Hence, the Treasury started pushing for increasing inflation targets to ensure a slower disinflation path. As 2017 came to an end, the Finance Minister started doubting whether it would be able to finance abroad the stubborn deficit and started demanding that the Central Bank shorten its maturities in the local peso market" (Sturzenegger 2019, 29). The battle was won by the Treasury: in December 2017, the government—the central bank included—announced the change in the inflation target: "The President had decided to fire the Governor if needed to go ahead. So the Central Bank was confronted with an Executive that had decided to lower rates, increase the inflation targets 5 p.p. (from 10 to 15 percent), and shorten the maturity of Central Bank liabilities (basically 1–5 months)" (Sturzenegger 2019, 29). From Sturzenegger's point of view this decision was a hard blow to the market's credibility on the strongest pillar of the economic plan: the monetary policy framework. Four months later the government was finding itself unable to get financing from global markets, which marked the beginning of the end of the Macri administration. The third question that will be addressed through the model is, thus, the hypothetical effects that the inflation targeting regime could have had in the absence of fiscal dominance.

Besides Sturzenegger's remarks on the policies adopted by his own government, there are other critiques that were made to the macroeconomic program. We select two of them: i) the appropriateness of an inflation targeting framework to tackle the dynamics of prices and whether the initial conditions for such a regime were met; and ii) the massive increase in the external debt. Regarding the monetary policy framework, it is argued that the inflation theory embedded in the New Keynesian model did not account for Argentina's main drivers of inflation, mainly the movements in the exchange rate and the price of utilities (which in the

model are taken as an exogenous shock with zero mean), many of which are important inputs of other goods and services. The empirical evidence for Argentina suggests that supply-side factors tend to be more relevant in the explanation of the dynamics of prices than demand pressures (Zack, Montané, and Kulfas 2018). Moreover, as Libman (2018) explains, the historical evidence shows that inflation targets were used more to keep price dynamics low than to stabilize a high rate of inflation and that they tend to work when a specific set of initial conditions are met (which was not the case in Argentina). From these assessments it is interesting to examine in hindsight what could have been the effects of a less ambitious inflation targeting framework. Such a program would have not taken supply-side factors as exogenous shocks but rather as key determinants of prices, which should have been treated in a more careful manner, probably at the cost of reducing the speed of convergence toward a balanced budget. This is the fourth question that will be addressed by means of the model.

The second critique to the plan implemented by the Macri administration concerns the massive increase in external indebtedness and its relationship with capital outflows. As has been documented by different authors (Brenta 2019; Manzanelli, González, and Basualdo 2017), capital flight has been a constant phenomenon in the recent decades, adhering to a series of factors among which one can identify the pattern of productive specialization, the share of natural resources in income, the high degrees of concentration of foreign capital in the ownership of nonfinancial corporations, the subsequent macroeconomic crises and inflation, and the absence of a sufficiently developed capital market. However, capital outflows tend to increase when restrictions are lifted and, in particular, in times of surges in the external debt. Using the balance of payments residual method, Rua and Zeolla (2018) conclude that an important part of capital outflows was financed by means of newly acquired external debt, which in turn was mostly denominated in foreign currency. The misuse of a valid tool like foreign financing ends up putting more pressure on the original problem: the external constraint. Even if this constraint can be removed temporarily (while foreign capital keeps on flowing inwards), the result is the accumulation of obligations in foreign exchange that eventually become impossible to pay. In other words, the processes of external indebtedness makes the economy move from a speculative to a Ponzi position, which lasts as long as the creditors are willing to keep the music going. Thus, a fifth question that can be addressed through the model

is whether Macri's macro could have been more stable if the degree of foreign indebtedness would have been smaller.[24]

The alternative interpretations to Argentina's macroeconomic performance in the 2010s and the two economic models that were implemented provide us with four questions that, together, can shed some light on two more general but, at the same time, fundamental questions: Could any of the governments that ruled Argentina during these years have found a more sustainable policy framework? And, if not, is it possible to find the solutions to Argentina's persistent instability in the domain of macroeconomics? In the next section we proceed to the construction of the analytical device through which the questions posed in this section will be addressed.

4. ARGENTINA'S ECONOMY IN THE LIGHT OF SFC MODELS

In this section we lay the foundations for the construction of the empirical SFC model for Argentina. After a brief revision of the most relevant contributions to this modeling approach, we present the matrices and the variables upon which the model of the next section is built.

Although the SFC methodology had been used for decades, it was the publication of Wynne Godley and Marc Lavoie's book in 2007 that provided a number of benchmark models that paved the way for a growing number of contributions. The success of these models in anticipating the events that would end up triggering the GFC[25] was also helpful in gaining attention from different strands of heterodox economics.

According to Zezza and Zezza (2019, 135–36), SFC models rely on five principles: i) horizontal consistency, which means that the model accounting should record each payment as an outflow for one sector and an inflow for a different sector, identifying who pays whom; ii) vertical consistency, which implies that each payment/receipt should be recorded once in the current account of the sector involved, and at least once more as a change in the assets/liabilities of that

[24] This question is not treated in this draft, but will be dealt with in later versions of the paper.
[25] For a detailed description of how the SFC logic underlies most of the analysis that warned about increasing fragility years before the crisis, see Bezemer (2010).

sector; iii) flows-to-stock consistency, which means that any stock of real and financial assets at current prices at the end of the accounting period is given by its previous value plus the corresponding flows and net capital gains during the period; iv) balance sheet consistency, which implies that the financial assets of a sector must match the financial liabilities of one or more sectors, possibly matching creditors to debtors; and v) stock-to-flows feedbacks, which account for the fact that financial liabilities imply future payments from one sector (debtor) to another (creditor). From these principles one can see the intrinsic dynamic nature of SFC models, as well as the path-dependence that characterizes the results these models produce. Another important feature derived from these principles is that stock variables can influence the dynamics of flows through the behavioral equations. Overall, the benefit of adopting an SFC methodology in empirical model building—compared to flow models—is in laying down the interconnections between balance sheets and flows of payments (Zezza and Zezza 2019, 136).

A benchmark empirical SFC model upon which later contributions would build can be found in Zezza (2009). This model describes the US economy as composed of three aggregate sectors: the private sector (containing households, nonfinancial corporations, and banks), the public sector, and the external sector. Although the financial component of the model (the flow-of-funds matrix) is rather simple, the model is able to produce important insights into the dynamics of the US economy. Later on, Papadimitriou, Nikiforos, and Zezza (2013) use this same structure to analyze the case of Greece, giving birth to the Levy Institute Model for Greece (LIMG). These two models are regularly used to produce reports on the economic performance and sustainability of Greece and the United States. More recently, there has been a growing interest in this modeling approach, leading to the development of new country models.

Burgess et al. (2016) build a model for the United Kingdom, which they use to examine the performance of the economy under several scenarios, such as increases in banks' capital ratios, sudden stops, changes in investment, increases in house prices, and fiscal expansions. An important contribution of this model is that it disaggregates the private sector into four different subsectors: households, nonfinancial corporations, banks, and insurance companies and pension funds. Passarella (2019) builds a medium-scale model with annual data to study the effect of different fiscal policy stances in the evolution of financial balances. More recently, Pierros (2020) builds upon the LIMG model to incorporate labor market institutions to address the

effects of changes in income distribution on the sustainability of the Greek economy. Bryalsen and Raza (2020) build a model for Denmark to study the bidirectional relationships between the real and financial sides of the economy under fiscal and monetary shocks. Finally, Zezza and Zezza (2020) develop a quarterly model for Italy with a detailed description of the private sector and the real and financial interactions between households, nonfinancial corporations, and banks.

In the specific case of Argentina, the closest precedent to the model presented here was developed by Panigo et al. (2009). In this paper the authors build a structural macroeconomic model to study the effects of different fiscal policies. The model is capable of capturing the interdependences between supply and aggregate demand and their implications for economic growth. It also includes income distribution aspects and the factors that determine the balance of payments constraints on growth. Their description of the impact of aggregate demand on growth, both in the short and long term, is fundamentally defined through the introduction of dynamic economies of scale. The model is made up of 13 behavioral equations, 15 accounting identities, and 17 exogenous variables. The set of exogenous variables includes those related to the international context (world output, international interest rate, or external labor productivity) and fiscal policy variables (tax rates, interest rates, public spending, etc.). According to the authors, the predictive capacity of the model, both in sample and out of sample, is good enough to consider the model a valid approximation of Argentina's economy.

Another relevant precedent of a structural macroeconometric model for Argentina was developed by Serino (2009), who builds a structuralist computable general equilibrium (CGE) model to study the response of the economy's main variables to different shocks in international commodity prices and the economic policies that the government may adopt in these situations. The author highlights the convenience of using a structural CGE for his object of analysis: the interactions between economic sectors with different characteristics and their particular responses to the shocks under consideration. The structuralist orientation of the work is expressed in the sectoral distinctions introduced in the model: a differentiation is made between the primary tradable sector (that is capable of competing in global markets) and the rest of the tradable sectors (which need protection to survive). The model also makes distinctions within

the services sector: the one oriented to production activities, whose dynamics affect the competitiveness of the tradable sector, and the consumption-oriented services sector.

More recently Guaita and Michelena (2019) developed an empirical model based on a social accounting matrix previously built by Michelena et al. (2017). Their model intends to provide a benchmark for analyzing economic performance under different economic policy scenarios and exogenous shocks. It consists of a single-good, open economy with five sectors (production, households, firms and banks, the government, and the rest of the world). The model provides an explicit description of price determination, the labor market, and portfolio choices. They conduct two simulation exercises: one where there is a negative exogenous shock in the terms of trade and another one where the growth of the rest of the world increases, in both cases obtaining reasonable results.

Structure of the Model

The model developed in this and the next section rests on the Levy Economics Institute of Bard College's approach and therefore consists of four institutional agents: the private sector (which comprises households, firms, and banks), the government, the central bank, and the rest of the world. The model includes eight financial assets and one single real asset: capital. These are all presented in the balance sheet (table 1). The private sector keeps its wealth under the form of money (H), bills issued by the central bank (B), bonds issued by the government (DD), and foreign assets (FA), which are a liability of the rest of the world. The private sector's only liability is given by the external debt (ED^P), which includes the different types of liabilities that arise from the firms' financing in foreign markets. The private sector accumulates capital ($k^P P^K$) as a result of investment (net of depreciation). The government covers its financing needs through three different types of liabilities: the domestic debt purchased by the private sector, the external debt that is purchased by the rest of the world (ED^G), and the advances provided by the central bank (A). The government also keeps deposits in dollars (D^{USD}) at the central bank and accumulates capital ($k^G P^K$) as a result of public investment. The assets and liabilities that compose the balance sheets of the central bank and the rest of the world have already been mentioned in the description of the balance sheets of the private sector and the government.

Table 1: Balance Sheet

	Private Sector	Government	Central Bank	Rest of the World	Total
Money	H_t		$-H_t$		0
Deposits		$D_t^{USD}E_t$	$-D_t^{USD}E_t$		0
Advances		$-A_t$	A_t		0
Bills	B_t		$-B_t$		0
Bonds	DD_t	$-DD_t$			0
Public Ext. Debt		$-ED_t^G E_t$	$-ED_t^{CB}E_t$	$ED_t^G E_t$	0
Private Ext. Debt	$-ED_t^P E_t$			$ED_t^P E_t$	0
Foreign Assets	$FA_t^P E_t$		$FA_t^{CB}E_t$	$-FA_t E_t$	0
Capital	$k_t^P p_t^K$	$k_t^G p_t^K$			$k_t p_t^K$
Wealth	W_t^P	W_t^G	W_t^{CB}	W_t^{RW}	$k_t p_t^K$

Since the foreign assets held by the private sector and central bank, as well as the external debt issued by both the private sector and the government are all denominated in US dollars, the movements in the exchange rate give rise to revaluation effects. The changes in the price of capital goods can also lead to revaluation effects for both the private sector and the government. These revaluation effects are summarized in the revaluation account (table 2).

Table 2: Revaluation Account

	Private Sector	Government	Central Bank	Rest of the World	Total
Rev. Foreign Assets	$-FA_{t-1}^P \Delta E_t$		$-FA_{t-1}^{CB}\Delta E_t$	$FA_{t-1}\Delta E_t$	0
Rev. Private Ext. Debt	$ED_{t-1}^P \Delta E_t$			$-ED_{t-1}^P \Delta E_t$	0
Rev. Public Ext. Debt		$ED_{t-1}^G \Delta E_t$	$ED_{t-1}^{CB}\Delta E_t$	$-ED_{t-1}^G \Delta E_t$	0
Rev. Deposits Dollars		$-D_{t-1}^{USD}\Delta E_t$	$D_{t-1}^{USD}\Delta E_t$		0
Rev. Capital	$-k_{t-1}^P \Delta P_t^K$	$-k_{t-1}^G \Delta P_t^K$			$-k_{t-1}\Delta P_t^K$

The transactions flow matrix (table 3) captures all the flows arising from the interactions between the institutional agents in the model. The upper part of the matrix (until the saving account) consists of the social accounting matrix, which includes all the current transactions that take place within a certain period. As a result of these transactions of production, income, and spending, each institutional agent obtains a financial result, which we call “saving” or “net lending.” The lower part of the matrix is the flow-of-funds. This submatrix registers the changes in the financial assets and liabilities of the agents in the economy. For every agent the sum of these changes equals the change in its net worth, which in turn must be equal to its saving. The fact that each column is equal to zero implies that ex post the budget constraint of each agent is

always fulfilled. However, this does not imply any specific order of causality in the fulfillment of the budget constraint.

The model consists of a single-good economy where domestic production is captured by GDP. Production is assumed to be demand-led (inventories are neglected) and carried out by firms and households. Firms use labor (formal and informal), capital, and imported intermediate goods as inputs. Households contribute to production through the supply of labor services to firms (compensation for which is given by wages) and through self-employment (which is compensated for by mixed income). Public employment, which comprises the bulk of public consumption and is supplied by households, is also part of aggregate demand. For the sake of simplicity, it is assumed that all imported goods are purchased by firms as part of the production process.

The production sector pays households a wage in exchange for their labor services. It is assumed that mixed income is also paid by the production sector to households. Both the wage paid by the government and public employment are considered exogenous. Private employment, both formal and informal, is endogenous and mainly determined by the level of activity. Private wages are also endogenous and depend mainly on the level of employment and inflation expectations. Self-employment and its compensation (mixed income) are assumed to be exogenous.

The production sector receives subsidies from the government as part of the regulation of the price of utilities, such as electricity, gasoline, and public transportation (NT). Indirect taxes, such as the value-added tax (VAT), are paid to the government.[26] The difference between the productions sector's sales (net of the value-added tax) and the wage bill plus the subsidies received from the government gives the gross profits (F) or gross operating surplus (GOS) that are realized by firms (which belong to the private sector).

[26] Although this tax is paid by households when they consume final goods and services, their inclusion in this section of the matrix follows from the need to be consistent in the valuation of the different variables. While the components of aggregate demand are valued at market prices, the variables included in the income generation account are written at basic prices. Moreover, the deduction of the value-added tax from the value of the final sales is necessary because otherwise the gross operating surplus would be overestimated.

The line denoting taxes in the transactions flow matrix comprises a broad range of transactions from the private sector to the government. Households pay 40 percent of the total contributions to the social security system and 50 percent of subnational taxes. The sum of these two items plus the income tax paid by medium- and high-income workers gives the total taxes paid by households to the government (T^H). The remaining part of tax collection is assumed to be paid by firms (T^F). These include the remaining part of the contributions to the social security network, the other half of subnational taxes, and other taxes (such as income taxes paid by corporations and export duties). This level of detail in the description of taxes is made to allow for specific simulation exercises.

Table 3: Transactions Flow Matrix

	Production	Private Sector	Government	Central Bank	Rest of the World	Total
Private Consumption	C_t	$-C_t$				0
Investment	I_t	$-I_t^P$	$-I_t^G$			0
Government Consumption	GC_t		$-GC_t$			0
Exports	$X_t E_t$				$-X_t E_t$	0
Imports	$-IM_t E_t$				$IM_t E_t$	0
$[AccountingMemo]$	$[FinalSales_t]$	$[WB_t^G]$				$[Y_t]$
Private Wage Bill	$-WB_t^P$	WB_t^P				0
Public Wage Bill		WB_t^G	$-WB_t^G$			0
Mixed Income	$-MI_t$	MI_t				0
Net Taxes on Production	$-NT_t$		NT_t			0
VAT	$-VAT_t$		VAT_t			0
Profits	$-F_t$	F_t				0
Taxes		$-T_t^F - T_t^H$	T_t			0
Social Security		SS_t	$-SS_t$			0
Other Expenditures		OE_t	$-OE_t$			0
Interest Priv. Ext. Debt		$-r_{t-1}^{P*} ED_{t-1}^F E_t$			$r_{t-1}^{P*} ED_{t-1}^F E_t$	0
Interest Pub. Ext. Debt			$-r_{t-1}^{G*} ED_{t-1}^G E_t$		$r_{t-1}^{G*} ED_{t-1}^G E_t$	0
Interest Bills		$r_{t-1} B_{t-1}$		$-r_{t-1} B_{t-1}$		0
Interest Bonds		$r_{t-1}^G DD_{t-1}$	$-r_{t-1}^G DD_{t-1}$			0
Transfer of Profits			F_t^{CB}	$-F_t^{CB}$		0
Auxiliary Flow		AF_t^P		AF_t^{CB}	$AF_t^{RW} E_t$	0
Saving		S_t^P	S_t^G	S_t^{CB}	S_t^{RW}	0
Δ Money		$-\Delta H_t$		ΔH_t		0
Δ Deposits Dollars			$-\Delta D_t^{USD} E_t$	$\Delta D_t^{USD} E_t$		0
Δ Advances			ΔA_t	$-\Delta A_t$		0
Δ Bills		$-\Delta B_t$		ΔB_t		0
Δ Bonds		$-\Delta DD_t$	ΔDD_t			0
Δ Public Ext. Debt			$\Delta ED_t^G E_t$	$\Delta ED_t^{CB} E_t$	$-\Delta ED_t^G E_t$	0
Δ Private Ext. Debt		$\Delta ED_t^P E_t$			$-\Delta ED_t^P E_t$	0
Δ Foreign Assets		$-\Delta FA_t^P$		$-\Delta FA_t^{CB} E_t$	$\Delta FA_t E_t$	0
Δ Auxiliary Stock		$-\Delta AS_t^P$	$-\Delta AS_t^G$	$-\Delta AS_t^{CB}$	$-\Delta AS_t^{RW} E_t$	0
Total	0	0	0	0	0	0

Social security benefits (*SS*), which include pensions and diverse cash transfer programs, are paid by the government entirely to households. For households, these benefits make up an additional component of disposable income, which also includes all the other transfers (unspecified for the purpose of the model) from the government to the private sector (*OE*).

The model includes eight financial assets, four of which entail the payment of interest. In the case of government deposits in foreign currency held at the central bank it is assumed that no interest accrues because the value of the flow is very low all along the time span. The same applies to foreign assets held by the private sector and the central bank. In the case of money there is no interest by definition. It should be noted that the interest payments accrued from the external debt—issued by the private sector and government—are originally paid in US dollars. Thus, these flows must be transformed into domestic currency through the nominal exchange rate.

The saving of each institutional agent is obtained as a result of the sum of all the current transactions in the social accounting matrix. For instance, in the case of the private sector, saving (S^P) is given by the difference between current income and outlays. Current income is given by the sum of the total wage bill (public and private), mixed income, gross profits, social security benefits, other expenditures of the government, and income derived from the holding of financial assets. Current outlays consist of private consumption and investment, taxes, and the interest accrued from liabilities. The same logic applies to the other institutional agents. Since the saving of each agent is logically and economically dependent on the incomes and outlays of other institutional agents, it must be the case that in the aggregate the overall flow of net lending is equal to zero, as is derived from the horizontal sum of the components in the saving line.

$$S_t^P + S_t^G + S_t^{CB} + S_t^{RW} = 0$$

Since the government and the central bank constitute the public sector, this equation can be rewritten in such a way that it represents the well-known identity that states that the sum of the three sectors' saving must always be equal to zero or, phrased differently, that the sum of public and private saving must always be equal to the current account (the negative of external saving).

$$Private\ Saving\ +\ Public\ Saving\ +External\ Saving = 0$$

Construction of the Transactions Flow Matrix

Since there are no officially published social accounting matrices and flow-of-funds tables, the transactions flows matrix has to be built using different data sources that are not always mutually consistent.[27] Moreover, the lack of an official framework upon which to base the construction of these tools that constitute the cornerstone of SFC modeling makes the definition of the scope of the model (mainly the number of institutional agents and quantity of financial assets) more arbitrary than usual. In this subsection three issues are addressed simultaneously. First, the data sources of the variables used in the model are defined. Second, some important variables, which are not directly observed or for which there are no official data sources, are obtained implicitly (for instance, the average interest rate on the external private debt can be computed as the ratio between the flow of interest payments and outstanding stock of debt). Finally, some adjustment variables are created to ensure that all the accounting identities are fulfilled.

A first clarification that needs to be made is that the institutional agent called "government" is given by the aggregate of the central government and the provincial administrations, i.e., the general government. The data on the components of aggregate demand were collected from National Institute of Statistics and Surveys (INDEC). The same data source was used to obtain the public employees' compensation, which is a component of aggregate demand. The part of government expenditures directed to firms (GC^P) was computed as the difference between total public consumption and the compensation of public employees.

The public wage bill is given by the product of the public wage and public employment (L^G). The private wage bill has two components: formal and informal employment (L^F and L^I, respectively). An important part of employment in Argentina takes the form of self-employment, which is compensated for by mixed income. The average wage paid by both the private and public sector (w^G and w^F, respectively) were computed as the quotient of the wage

[27] Zezza and Zezza (2019) show that even for countries with more resources to produce good statistics like the United States, there might be large discrepancies between the different data sources.

bill and the number of employed workers, both formal and informal (which was taken from INDEC). Since the information on the generation of income account is only available starting in 2016Q1, the time series were extended backward using the series of the average wage (both public and private) produced by the Employment and Business Dynamics Observatory (OEDE). For the case of mixed income, it was assumed that the compensation (w^{SE}) followed the same time path as the wages of private sector workers.

$$WB_t^G = w^G L^G \quad \text{(A)}$$

$$WB_t^P = w^F (L_t^F + L_t^I) \quad \text{(B)}$$

$$MI_t = w^{SE} L_t^{SE} \quad \text{(C)}$$

All the data related to the fiscal block of the model (value-added tax collection, income taxes, export duties, contributions to the social security network, and provincial taxes) were obtained from INDEC. Subsidies, which in the transactions flow matrix are comprised of the net taxes on the production account, are given by the current transfers of the nonfinancial public sector to the private sector. The transfers included in the social security variable are the social security benefits, which are also informed by data from INDEC.

The information on these flows is not only useful for building the transactions flow matrix, but also to implicitly compute some rates that can work as proxies for very important fiscal policy tools. The value-added tax rate (τ^{VAT}) is computed as the ratio of the total value-added tax collected to nominal private consumption. The income tax rate paid by households (τ^H) is given by the ratio of the corresponding flow (IT^H) to the total wage bill. The income tax rate paid by firms (τ^F) is given by the ratio of the corresponding flow (IT^F) to gross profits. The average export duty (τ^X) is computed as the ratio of the total flow of export duties paid to the government (XT) to nominal exports expressed in domestic currency (X). Finally, the contribution rate of households and firms ($\tau_t^{SS,H}$ and $\tau_t^{SS,F}$) to the social security network are calculated as the ratio between the payment that each sector makes and the wage bill comprising formal workers.

$$\tau_t^{VAT} = \frac{VAT_t}{C_t} \quad \text{(D)}$$

$$\tau_t^{H} = \frac{IT_t^H}{w_t^G L_t^G + w_t^F L_t^F} \quad \text{(E)}$$

$$\tau_t^{F} = \frac{IT_t^F}{GP_t^F} \quad \text{(F)}$$

$$\tau_t^{X} = \frac{XT_t}{PX_t} \quad \text{(G)}$$

$$\tau_t^{SS,H} = \frac{CONT_t^H}{w_t^G L_t^G + w_t^F L_t^F} \quad \text{(H)}$$

$$\tau_t^{SS,F} = \frac{CONT_t^F}{w_t^F L_t^F} \quad \text{(I)}$$

The current transfers to the private sector are assumed to be entirely sent to firms under the form of subsidies as part of the utility price regulation policy. Taking electricity as a reference, it is possible to compute the average subsidy rate using the following equation, where P^R is the regulated price of electricity (the price paid by users) and AMC is the average cost. Both variables are taken from the management company of the wholesale electricity market (CAMMESA).[28] Taking the real demand for electricity (d^{ELEC}) and its actual cost (given by the average cost) it is possible to compute the nominal demand for electricity (D^{ELEC}). Knowing the average subsidy rate and the nominal demand for electricity, we compute the transfers to the private sector for the purpose of keeping the price of electricity below the level of its costs (NT^E). Since the total transfers are known, it is then possible to compute the amount of the transfers that are used to keep the price of the remaining services at the target price set by the government (NT^O). Assuming that the subsidy rate for the rest of the public services is the same as electricity, it is possible to compute the nominal demand for the former.

[28] I am grateful to Esteban Serrani who helped me to find this information.

$$s_t = 1 - (\frac{P_t^R}{AMC_t}) \quad \text{(J)}$$

$$D_t^{ELEC} = d_t^{ELEC} AMC_t \quad \text{(K)}$$

$$NT_t^E = D_t^{ELEC} s_t \quad \text{(L)}$$

$$NT_t^O = NT_t - NT_t^E \quad \text{(M)}$$

$$D_t^O = (\frac{NT_t^O}{NT_t^{ELEC}}) D_t^{ELEC} \quad \text{(N)}$$

The total amount of current transfers to households are obtained from the social security benefits informed by the INDEC data. Taking the number of beneficiaries (the retirees and the beneficiaries of the universal allowance per child are considered for the calculation, which account for the majority of the beneficiaries), informed by data from the National Administration of the Social Security (ANSES), it is possible to compute the average nominal allowance (AL), which can be used as a policy variable in the model.

$$AL_t = \frac{SS_t}{Beneficiaries_t} \quad \text{(O)}$$

The interest accrued from the holdings of foreign assets was computed using the federal funds rate (r^*), which was obtained from the Federal Reserve Bank of St. Louis. This (annual) rate was converted into its quarterly version and then applied to the stock of foreign assets held by households and the central bank in the previous period. The foreign assets held by the private sector were obtained from the international investment position, where the assets of the "other sectors" were taken.[29] Since this time series is only available starting in 2016Q1, the series were completed backward using the change in the net acquisition of foreign assets of the private sector informed by data from the Central Bank of Argentina (BCRA).

[29] The explicitly defined sectors in the international investment position are the government, the central bank, and banks. Therefore, households and firms are both included in the "other sectors" variable. It is not possible to distinguish between the share of assets held by each of these two agents, therefore, it was assumed that the totality of the assets is held by households.

The interest payments on the government's external debt are obtained from the balance of payments published by the BCRA. Based on this flow and the outstanding stock of public external debt it is possible to compute the implicit rate of interest r^{G*}(Zezza and Zezza 2019, 140). The same procedure is followed to calculate the rate of interest on the private external debt. In order to do this it is first necessary to obtain the total interest paid by the private sector, which is obtained as the difference between the total outflows of foreign exchange corresponding to interest payments (taken from the balance of payments published by the BCRA) and the part that corresponds to the public external debt. The resulting implicit rates can eventually be used to analyze the impact of a change in the interest rate on the external sustainability of the economy.

$$r_t^{G*} = \frac{Interest\ Payments\ on\ External\ Debt_t^G}{ED_{t-1}^G} \quad \text{(P)}$$

$$r_t^{P*} = \frac{Total\ interest\ payments\ on\ External\ Debt_t - Interest\ Payments\ on\ External\ Debt_t^G}{ED_{t-1}^P} \quad \text{(Q)}$$

The same method is replicated to compute the interest rate on the government's internal debt, which is denominated in domestic currency. The flow of interest payments corresponding to the debt in domestic currency is obtained from the difference between the total interest payments made by the government (which are obtained from INDEC), the part of them that correspond to the external debt, and the interest payments derived from the advances provided by the central bank. The resulting interest payments are then divided by the stock of domestic debt (DD), which is computed as the sum of medium- and long-term bonds and bills issued by the government (data on which are obtained from Argentina's Secretary of Finance).

$$r_t^G = \frac{Total\ Interest\ Payments_t^G - Interest\ Payments\ on\ External\ Debt_t^G E_t - Interest\ Payments\ on\ Advances_t}{DD_{t-1}} \quad \text{(I)}$$

For the interest payments on the bills issued by the central bank (B), the monetary policy rate was used. The stock of outstanding bills was obtained from the BCRA. For the government's interest payments to the central bank for the stock of outstanding advances (which were obtained from the BCRA's balance sheet), the rate of interest on advances is used.

Since there are no officially published social accounting matrices and flow-of-funds tables, the construction of the transactions flows matrix has to be undertaken using different data sources that are not always mutually consistent. This poses the problem of the sum of the components that define each agent's savings not necessarily matching the sum of the changes in that agent's assets and liabilities. In other words, from the information collected for the construction of the transactions flow matrix there is nothing that ensures the fulfillment of the following three identities:

$$S_t^i = Current\ Income_t^i - Current\ Outlays_t^i \quad for\ all\ i = P, G, CB, RW$$

$$S_t^i = FoF_t^i \quad for\ all\ i = P, G, CB, RW$$

$$S_t^i + \sum_{j=1}^{J} Rev_t^{j,i} = \Delta W_t^i \quad for\ all\ i = P, G, CB, RW\ and\ j = K, FA, ED^F, ED^G, D^{USD}$$

where S is saving, $Current\ Income$ is the sum of all the current income sources comprised in the social accounting matrix, $Current\ outlays$ is the sum of all the current expenditures comprised in the social accounting matrix, FoF is the sum of the variations of the elements that comprise the balance sheet of each agent i, Rev is the revaluation effect derived from the variations in the nominal exchange rate and the price of capital goods, and W is the net worth.

The first identity provides the usual definition of savings. The second identity states that each agent's savings must equal the sum of the changes in its holdings of assets and liabilities. The third identity states that the change in the net worth of agent i must equal the sum of the changes in its holdings of assets and liabilities (i.e., its savings) plus the revaluation effect that arises from the movements in the nominal exchange rate and the price of capital goods. Fulfilling these identities in an empirical model where the data sources are not complete is not easy because the production of the data of the different government agencies is not carried out in such a way that accounting consistency is attained. In order to make the model's accounting consistent, some auxiliary flow and stock variables (AF and AS, respectively) are created,

following one of the methodologies suggested in Zezza and Zezza (2019, 138).[30] The rules upon which these variables are built is the following:

$$AF_t^i = S_t^i - (Current\ Income_t^i - Current\ Outlays_t^i)$$

$$\Delta AS_t^i = S_t^i - FoF_t^i$$

Let us begin with the rest of the world. Their net savings is given by the negative of the current account (*CA*) data from the BCRA. The current income and outlays are those presented in the social accounting matrix. The auxiliary flow variable is computed as the discrepancy between these two variables, which should be theoretically identical.[31] The auxiliary stock variable is calculated as the difference between external saving (the negative of the current account), the auxiliary flow variables, and the sum of the changes in the components of the balance sheet.

$$AF_t^{RW} = -CA_t - (-X_t + IM_t + r_{t-1}^{P*} ED_{t-1}^P + r_{t-1}^{G*} ED_{t-1}^G) \quad \text{(S)}$$

$$\Delta AS_t^{RW} = -CA_t + AF_t^{RW} - (\Delta ED_t^P + \Delta ED_t^G + \Delta ED_t^{CB} - \Delta FA_t)E_t \quad \text{(T)}$$

In the case of the government a slightly different procedure is applied. Since all the elements that make up its savings are specified there is no need to include the auxiliary flow variable. The auxiliary stock variable is calculated as the difference between the savings of the government and the sum of the changes in the components of the balance sheet.

$$AF_t^G = 0 \quad \text{(U)}$$

$$\Delta AS_t^G = S_t^G - (\Delta D_t^{USD} E_t - \Delta DD_t - \Delta AT_t - \Delta ED_t^G E_t + \Delta k_t^G P_t^K) \quad \text{(V)}$$

[30] The other option suggested by Zezza and Zezza (2019) consists of splitting the value of the discrepancy into the different components of each agent's line or column. The pros of the chosen strategy are that model variables will exactly match the data, while the cons are that the number of model variables increases. The cons of Zezza and Zezza's strategy would have been that model variables only would have approximated the actual data.

[31] The reason why these two variables do not exactly match is that not all the components of the current account are being taken into account. Thus, the auxiliary flow variable could be thought of as a variable that contains all the components that were omitted in order to keep the model simple.

The central bank's net saving (S^{CB}) is calculated as the sum of the components of the social accounting matrix. However, since accounting consistency requires that the sum of the components of each row adds up to zero, the central bank's auxiliary flow variable is defined in such a way that this condition is met. For its part, the auxiliary stock variable is computed as the difference between the savings and the sum of the changes in the components of the balance sheet.

$$AF_t^{CB} = -AF_t^P - AF_t^{RW} E_t \tag{W}$$

$$\Delta AS_t^{CB} = S_t^{CB} + AF_t^{CB} - (\Delta FA_t^{CB} E_t + \Delta AT_t - \Delta H_t - \Delta B_t - \Delta RR_t - \Delta D_t^{USD} E_t - \Delta ED_t^{CB} E_t - \Delta AS2_t^H) \tag{X}$$

Finally, the closure of the private sector's budget constraint must be coherent with all the assets, liabilities, and current transactions of the other institutional agents. The fact that these accounting relations must always hold can be used to compute some of the variables that are not directly observable or found in the official data sources. The private sector's savings are defined as the residual of the savings of the rest of the institutional agents in the economy. The same logic is applied to defining the change in the auxiliary stock variable of households. The incorporation of this additional component to the flow-of-funds requires an extra adjustment variable that ensures the consistency between the private sector's savings and the flow-of-funds.[32] The households' auxiliary flow variable is defined so that net savings and current transactions of the social accounting matrix are mutually consistent as well.

$$S_t^P = -S_t^G - S_t^{CB} - S_t^{RW} \tag{Y}$$

$$\Delta AS_t^P = -\Delta AS_t^G - \Delta AS_t^{CB} - \Delta AS_t^{RW} \tag{Z}$$

$$\Delta AS2_t^P = S_t^H - (\Delta FA_t^P + \Delta B_t + \Delta DD_t + \Delta H_t + \Delta AS_t^P - \Delta ED_t^P E_t + \Delta k_t P_t^K) \tag{AA}$$

$$AF_t^P = S_t^P - (WB_t^P + F_t + SS_t - T_t^H - T_t^F + i_{t-1} B_{t-1} + i_{t-1}^G DD_{t-1} - i_{t-1}^{P*} ED_{t-1}^P E_t - C_t - \Delta k_t P_t^K) \tag{AB}$$

[32] This auxiliary stock variable is assumed to enter as a liability for the central bank, as reflected in equation (U).

One last adjustment that is required in order to achieve full accounting consistency in the transactions flow matrix is to write two auxiliary variables that account for the discrepancy between the trade flows as defined in the national accounts (published in both constant and current pesos) and the balance of payments statistics (published in current US dollars). By writing these variables we make sure that the sum of the components of the lines corresponding to exports and imports also add up to zero.

$$Aux_t^X = X_t^{USD} E_t - X_t \qquad \text{(AC)}$$

$$Aux_t^{IM} = IM_t^{USD} E_t - IM_t \qquad \text{(AD)}$$

5. THE MODEL

In this section we present the system of difference equations that represent Argentina's economy. As is the case of every SFC model, the equations are derived from the structure of the transactions flow matrix. The model is composed of 68 endogenous variables, 17 of which are estimated econometrically (the results of the estimations are presented in the appendix). The remaining variables are determined through accounting identities that are derived from the transactions flow matrix, thereby ensuring the accounting coherence of the model. The model has 57 exogenous variables, 18 of which are considered policy variables, i.e., instruments that the government can change to pursue a specific goal. Table 4 summarizes the policy variables. A summary of all the model's variables is presented in the appendix. Lower (upper) case variables denote real (nominal) variables.

Table 4: Policy Variables

Policy tool	Symbol
Real public investment	i^G
Nominal public wage	w^G
Public employment	L^G
Government nominal operating expenditure	GC^P
Subsidy rate to the price of utilities	s
Allowance (cash transfer)	AL
Number of beneficiaries of cash transfer programs	$Beneficiaries$
Value-added tax rate	τ^{VAT}
Income tax rate for households	τ^H
Income tax rate for firms	τ^F
Social security contribution rate (households)	$\tau^{SS,H}$
Social security contribution rate (firms)	$\tau^{SS,F}$
Export duty rate	τ^X
Consumption credit	CR
Short-term interest rate	r
Interest rate on advances	r^A
Advances	A
Foreign reserves	FA^{CB}

Production and Employment

Production is assumed to be demand-led (equation [1]). Real investment is composed of both private and public investment (equation [2]). The latter is assumed exogenous and is part of the policy toolkit of the government. Public consumption is assumed to be entirely exogenous and given by the sum of the wages paid by the public administration and other operating expenditures, which are purchases of goods and services from the production sector (equation [3]). Public consumption, mainly the wages component, is a nominal variable that needs to be converted into real terms through the corresponding deflator (equation [5]).

$$y_t = c_t + i_t + g_t + x_t - im_t \quad (1)$$

$$i_t = i_t^P + i_t^G \quad (2)$$

$$G_t = WB_t^G + GC_t \quad (3)$$

$$WB_t^G = w_t^G L_t^G \quad (4)$$

$$g_t = \frac{G_t}{p_t^G} \quad (5)$$

Private consumption, investment, exports, and imports are endogenous variables that are estimated in the corresponding blocks of the model. In order to transform the nominal exports and imports into US dollars (as they are published in the balance of payments statistics), the procedure presented in equations (8–11) is followed. Then it is possible to obtain the nominal version of GDP, which is given by the sum of the nominal components of aggregate demand. In order to compute them, the corresponding price indices are used.

$$C_t = c_t p_t^C \quad (6)$$

$$I_t = i_t p_t^K \quad (7)$$

$$X_t = X_t^{USD} E_t - Aux_t^X \quad (8)$$

$$x_t = X_t / p_t^X \quad (9)$$

$$IM_t = IM_t^{USD} E_t - Aux_t^{IM} \quad (10)$$

$$m_t = IM_t / p_t^{IM} \quad (11)$$

$$Y_t = C_t + I_t + G_t + X_t - IM_t \quad (12)$$

The production sector pays wages to households (included in the private sector) in exchange for their labor services. The wage bill comprises not only the formal sector but also the informal (equation [13]). Self-employment, which is considered exogenous, and its compensation determine mixed income (equation [14]). Formal employment is given by the level of activity and unit labor costs (equation [15]). The values of the coefficients are estimated using an error correction equation, which explains the presence of the *EC* term in the equation. Informal employment is estimated as a ratio of formal employment, and is also determined by the level of activity and GDP volatility (defined as the standard deviation of real GDP in the last four periods). The values of the coefficients, estimations of which are presented in the appendix, are summarized in table 5. Given production and employment it is possible to compute labor productivity (equation [17]). Nominal unit labor costs are given by the ratio of the wage paid in the private sector and labor productivity (equation [18]).

$$WB_t^P = w_t^P (L_t^F + L_t^I) \tag{13}$$

$$MI_t = w_t^S L_t^S \tag{14}$$

$$\Delta log(L_t^F) = \eta_0 + \eta_1 \Delta log(y_t) + \eta_2 \Delta log(L_{t-1}^F) + \eta_3 \Delta log(ulc_{t-1}/p_{t-1}^C) + \eta_4 EC_{t-1}^{LF} \tag{15}$$

$$\Delta log(L_t^I/L_{t-1}^F) = \eta_5 + \eta_6 \Delta log(y_t) + \eta_7 \Delta log(L_{t-1}^I/L_{t-2}^F) + \eta_8 EC_{t-1}^{LI} \tag{16}$$

$$prod_t = \frac{y_t}{(L_t^F + L_t^I)} \tag{17}$$

$$ulc_t = \frac{w_t^P}{prod_t} \tag{18}$$

Table 5: Employment Equations Coefficients

$\eta_0 = 0$	$\eta_1 = 0.05$	$\eta_2 = 0.77$	$\eta_3 = -0.03$	$\eta_4 = -0.18$
$\eta_5 = 0$	$\eta_6 = -0.29$	$\eta_7 = 0.18$	$\eta_8 = -0.74$	

In this model the net taxes on production are only given by the subsidies that the government grants as part of the utility price regulation policy. The nominal demand for electricity is computed as the product of the real demand and the cost (equation [19]). The current transfers to the production sector to subsidize the final price of electricity are given by the nominal demand and the subsidy rate, which is exogenous and part of the government's policy toolkit (equation [20]). The same is done for the other public utilities (equation [21]). Adding these two sources of current transfers we obtain the net taxes on production (equation [22]). The price of utilities is given by the average cost (which is assumed to be exogenous) adjusted by the subsidy rate (equation [23]).[33] The real demand for electricity is a function of private consumption (equation [24]). The nominal demand for the other utilities is mainly given by output, the rate of capacity utilization, and the nominal demand for electricity (equation [25]).

$$D_t^{ELEC} = d_t^{ELEC} AMC_t \tag{19}$$

$$NT_t^{ELEC} = D_t^{ELEC} s_t \tag{20}$$

$$NT_t^{O} = D_t^{O} s_t \tag{21}$$

$$NT_t = NT_t^{ELEC} + NT_t^{O} \tag{22}$$

$$P_t^R = (1 - s_t) AMC_t \tag{23}$$

$$\Delta log(d_t^{ELEC}) = \varepsilon_0 + \varepsilon_1 \Delta log(c_t) + \varepsilon_2 EC_{t-1}^{delec} \tag{24}$$

$$\Delta log(D_t^{O}) = \varepsilon_3 + \varepsilon_4 \Delta log(Y_t) + \varepsilon_5 \Delta log(u_{t-1}) + \varepsilon_6 \Delta log(D_t^{ELEC}) + \varepsilon_7 EC_{t-1}^{DO} \tag{25}$$

[33] For the sake of simplicity it is assumed that the cost of production and the electricity subsidy rate and that of the other utilities are the same. Future versions of the model should provide a more detailed description of the cost structure of the different utilities where the government has a price regulation policy. Yet, splitting utilities into electricity and others in the current version of the model allows for more precise econometric estimations of the demand equations.

Table 6: Public Services Equation Coefficients

$\varepsilon_0 = 0$	$\varepsilon_1 = 0.14$	$\varepsilon_2 = -0.11$	$\varepsilon_3 = 0.02$
$\varepsilon_4 = 1.73$	$\varepsilon_5 = 0.01$	$\varepsilon_6 = -0.94$	$\varepsilon_7 = -0.67$

As a result of production, sales, and the payment of wages and net taxes on production, the production sector obtains a profit that is transferred entirely to the private sector. Recall that accounting consistency requires that the income that is distributed among the different members of the private sector is net of indirect taxes such as the value-added tax. The value-added tax is given by the level of nominal consumption and the tax rate, which is an exogenous policy tool (equation [26]). It should also be noted that the part of GDP that corresponds to the compensation of public employment is not part of the production sector's income. Equation (27) thereby ensures that the accounting relationship described in the production sector column of the transactions flow matrix is always fulfilled.

$$VAT_t = C_t \tau_t^{VAT} \tag{26}$$

$$F_t = (Y_t - VAT_t - WB_t^G) - WB_t^P - MI_t - NT_t \tag{27}$$

Private Sector

The main revenue sources of the private sector are the profits transferred from production and the payment of wages by both production and the government. The private sector also receives social benefits from the government, which are in turn given by three exogenous variables: the number of beneficiaries, the average allowance (both decided by the central government), and the current transfers of provincial governments to households, which are taken as exogenous.

$$SS_t = AL_t Beneficiaries_t + CT_t^H \tag{28}$$

Households and firms pay different types of taxes to the government. In the case of households, they pay the income tax, contributions to the social security network, and local taxes. Both the income tax (equation [30]) and contributions to social security (equation [31]) are given by the respective tax rate and wage bill earned by formal workers (employed in both the private and public sectors). Local taxes paid by households (TP^H) are assumed to be exogenous. In the case

of firms, they pay income tax (equation [33]), export duties (equation [34]), and contributions to the social security network (equation [35]), which depend on profits, nominal exports, and the formal private wage bill, respectively. Firms also pay local taxes (TP^F), which are exogenous.

$$T_t^H = VAT_t + IT_t^H + CONT_t^H + TP_t^H \quad (29)$$

$$IT_t^H = (w_t^F L_t^F + w_t^G L_t^G)\tau_t^H \quad (30)$$

$$CONT_t^H = (w_t^F L_t^F + w_t^G L_t^G)\tau_t^{SS,H} \quad (31)$$

$$T_t^F = IT_t^F + CONT_t^F + TX_t + TP_t^F \quad (32)$$

$$IT_t^F = F_t \tau_t^F \quad (33)$$

$$TX_t = X_t \tau_t^X \quad (34)$$

$$CONT_t^F = w_t^F L_t^F \tau_t^{SS,F} \quad (35)$$

The specification of the consumption equation requires that we first define how the private wage is determined. Equation (36) presents the evolution of the wage in the private formal sector as a function of employment in the formal sector and inflation.

$$\Delta log(w_t^F) = \varpi_0 + \varpi_1 \Delta log(L_{t-1}^F) + \varpi_2 \Delta log(p_{t-1}^C) + \varpi_3 EC_{t-1}^W \quad (36)$$

Table 7: Private Wage Equation Coefficients

$\varpi_0 = 0.04$	$\varpi_1 = 0.97$	$\varpi_2 = 0.34$	$\varpi_3 = -0.23$

The consumption equation follows a Keynesian structure, disposable income being its main driver. In order to account for the different propensities to consume within the subsectors that compose the private sector (formal workers, informal workers, pensioners, capitalists, etc.), the consumption equation distinguishes between the different sources of income. Equation (37)

gathers the disposable income of formal workers[34] and equation (38) the income of informal workers plus all the benefits provided by the social security network. Equation (39) defines the firm owners' disposable income. These three income sources are deflated using the private consumption deflator index. Note that in the consumption equation (equation [40]) the profits are also written in real terms (f) and one control variable is included: the nominal interest rate (r). Unlike the standard consumption functions used in SFC models, equation (40) does away with wealth effects. This decision was made after having tested for alternative specifications, all of which yielded nonsignificant results.

$$yd_t^1 = \frac{w_t^F L_t^F + w_t^G L_t^G + MI_t - T_t^H}{p_t^C} \quad (37)$$

$$yd_t^2 = \frac{w_t^I L_t^I + SS_t}{p_t^C} \quad (38)$$

$$f_t = \frac{F_t - T_t^F}{p_t^C} \quad (39)$$

$$\Delta log(c_t) = \alpha_0 + \alpha_1 \Delta log(yd_t^1) + \alpha_2 \Delta log(yd_t^2) + \alpha_3 \Delta log(f_t) + \alpha_4 \Delta log(r_{t-1}) + \alpha_5 EC_{t-1}^C \quad (40)$$

The private investment equation included in the model is rather eclectic, as it depends on many factors such as the rates of capacity utilization, interest, and profit (defined as the ratio of real profits to the stock of capital). Some control variables that account for factors that could have an effect on the state of capitalists' confidence, like the environment for "doing business" (which is proxied by the intensity of capital controls on outflows, since in Argentina these measures have brought about parallel exchange rates that end up inducing short-term speculative behaviors), the nominal exchange rate (in Argentina periods of devaluations are associated with instability), and the international price of commodities (during commodity booms investment in the primary sector might be encouraged), are also included in the estimation.

[34] Mixed income is taken as part of this income source given the large number of professional workers that undertake their activity in the form of self-employment.

$$\Delta log(\frac{i_t^P}{k_{t-1}}) = \kappa_0 + \kappa_1 \Delta log(u_{t-1}) + \kappa_2 \Delta log(r_{t-1}) + \kappa_3 \Delta log(controls_t) + \kappa_4 \Delta log(E_{t-1})$$
$$+\kappa_5 \Delta log(\frac{F_{t-1}}{k_{t-1}}) + \kappa_6 \Delta log(p_t^*) + \kappa_7 \Delta log(\frac{i_{t-1}^P}{k_{t-2}}) + \kappa_8 EC_{t-1}^I \quad (41)$$

Table 8: Consumption and Investment Equation Coefficients

$\alpha_0 = 0$	$\alpha_1 = 0.35$	$\alpha_2 = 0.04$	$\alpha_3 = 0.17$	$\alpha_4 = -0.08$
$\alpha_5 = -0.32$	$\alpha_6 = -0.75$	$\eta_7 = -0.01$	$\kappa_0 = -0.01$	$\kappa_1 = 0.31$
$\kappa_2 = -0.09$	$\kappa_3 = 0$	$\kappa_4 = -0.22$	$\kappa_5 = 0.29$	$\kappa_6 = 0.14$
$\kappa_7 = 0.46$	$\kappa_8 = -0.69$			

The last component of the private sector's current transactions are interest payments. The private sector pays interest on the outstanding stock of external debt. Regarding interest earnings, the private sector receives payments on its holdings of bills and bonds. Once all the current incomes and outlays have been defined, it is possible to write the equation for private savings (equation [42]).

$$S_t^P = WB_t^P + WB_t^G + MI_t + F_t - T_t^H - T_t^F + SS_t + OE_t + r_{t-1}B_{t-1} + r_{t-1}^G DD_{t-1}$$
$$-r_{t-1}^{P*} ED_{t-1}^P E_t + AF_t^P - C_t - I_t^P \quad (42)$$

The change in the real capital stock is given by investment minus depreciation (equation [43]). The change in the nominal capital stock must take into account the change in prices (equation [44]). The rate of capacity utilization is given by the level of activity, the technical coefficient v, and the real stock of capital (equation [45]).

$$\Delta k_t^P = i_t^p - \delta k_{t-1}^P \quad (43)$$

$$K_t^P = k_t^P p_t^K \quad (44)$$

$$u_t = \frac{y_y v}{k_t^P} \quad (45)$$

The model's stock-flow consistency requires that, after having accounted for the change in the stock of capital, the newly generated wealth (which is equal to private saving) is accumulated under the form of net acquisition of financial assets. The private sector's only liability—external debt—is assumed to be exogenous and given by the rest of the world's demand for domestic assets. The private sector holds four different financial assets: foreign assets, bills, money, and bonds.[35] The demand for bonds (equation [46]) is given by the interest rate on these assets and the market's perception of economic risk, which is approximated by the volatility of the nominal exchange rate. The same logic is applied in the definition of the demand for foreign assets (equation [47]) and bills (equation [49]), where the stock of public external debt and the policy rate, respectively, are taken as key determinants. In the three cases, a nonlinear relationship is assumed between the dependent variable and the interest rate on bonds, the stock of public external debt, and the policy rate.[36] Some control variables, like the price index and existence of capital controls, are also incorporated. Note that the acquisition of foreign assets by the private sector is written in domestic currency although the assets written on that line are denominated in US dollars. The reason for this is that the financial flow that gives rise to the acquisition of foreign assets is originally in domestic currency, since it is a result of the current transactions that take place within the local economy. The dollar version of the total stock of foreign assets held by the private sector is given by equation (48). The change in the private sector's holding of money acts as the buffer that ensures the fulfillment of the balance sheet identity (equation [51]). The wealth of the private sector is given by the difference between assets and liabilities (equation [52]). In order to obtain the nominal capital stock, the price deflator of investment (p^K) is used. Although the auxiliary stock variables as they were defined in the previous sections are all exogenous, the fact that the nominal exchange rate varies requires that equation (53) is explicitly included in the model.

[35] Although theoretical SFC models work with Tobinesque portfolio equations of the type proposed by Brainard and Tobin (1968) and Tobin (1969), it is not easy to build empirical approximations to the rate of return matrix embedded in this approach and to obtain estimators that respect its constraints. Some researchers, like Zezza and Zezza (2020), attempt to adapt the structure of the model to keep the main concepts embedded in Tobin's theory. In this model a simpler path is taken by estimating equations separately with the caution of obtaining estimations that are consistent with the intuitions underlying those decisions.

[36] These equations are estimated using the nonlinear autoregressive distributed lags methodology, as proposed by Shin, Yu, and Greenwood-Nimmo (2014). This methodology assumes that the reaction of the dependent variable to changes in the independent variable varies according to the direction in which the change goes. For instance, the variable in the third term of the right-hand side of equation (46) gathers the accumulated sum of all the positive changes in the interest rate on bonds. On the other hand, in the variable in the fourth term, where the "-" sign appears, the sum of all the negative changes in the interest rate on bonds is computed.

$$\Delta log(\frac{DD_t}{W^P_{t-1}}) = \gamma_0 + \gamma_1 log(p^C_{t-1}) + \gamma_2 log(r^{G+}_{t-1}) + \gamma_3 log(r^{G-}_{t-1}) + \gamma_4 controls_{t-1} +$$
$$+\gamma_5 \Delta log\left(\frac{DD_{t-1}}{W^P_{t-2}}\right) + \gamma_6 \Delta log(p^C_t) + \gamma_7 \Delta log(r^-_t) + \gamma_8 \Delta log(vol^E_{t-1}) \quad (46)$$

$$\Delta log(\frac{FA^P_t}{W^P_{t-1}}) = \gamma_9 + \gamma_{10} log(p^C_{t-1}) + \gamma_{11} log(ED^{G+}_{t-1}) + \gamma_{12} log(ED^{G-}_{t-1}) + \gamma_{13} controls_{t-1} +$$
$$+\gamma_{14} \Delta log\left(\frac{FA^P_{t-1}}{W^P_{t-2}}\right) + \gamma_{15} \Delta log(p^C_t) + \gamma_{16} \Delta log(ED^{G+}_t) + \gamma_{17} \Delta log(ED^{G-}_{t-1}) \quad (47)$$

$$FA^{P,USD}_t = \frac{FA^P_t}{E_t} \quad (48)$$

$$\Delta log(\frac{B_t}{W^P_{t-1}}) = \gamma_{18} + \gamma_{19} log(p^C_{t-1}) + \gamma_{20} log(i^+_{t-1}) + \gamma_{21} log(i^-_{t-1}) + \gamma_{22} controls_{t-1} +$$
$$+\gamma_{23} \Delta log(p^C_{t-1}) + \gamma_{24} \Delta log(i^+_{t-1}) \quad (49)$$

$$vol^E_t = \sqrt{\frac{\sum_{i=t-3}^{t} (E_t - \bar{E})^2}{3}} \quad (50)$$

$$\Delta H_t = S^P_t + \Delta ED^P_t E_t - \Delta B_t - \Delta DD_t - \Delta AS^P_t - \Delta FA^P_t E_t \quad (51)$$

$$W^P_t = K^P_t + H_t + B_t + DD_t + FA_t E_t + AS^P_t - ED^P_t E_t \quad (52)$$

$$\Delta AS^P_t = -\Delta AS^G_t - \Delta AS^{CB}_t - \Delta AS^{RW}_t E_t \quad (53)$$

Table 9: Private Sector Portfolio Equation Coefficients

$\gamma_0 = 0$	$\gamma_1 = 0.27$	$\gamma_2 = 1.58$	$\gamma_3 = -1.44$	$\gamma_4 = 0.08$
$\gamma_5 = 0.35$	$\gamma_6 = -6.36$	$\gamma_7 = -0.45$	$\gamma_8 = -0.29$	$\gamma_9 = -8.97$
$\gamma_{10} = -0.28$	$\gamma_{11} = 0.42$	$\gamma_{12} = -0.04$	$\gamma_{13} = -0.03$	$\gamma_{14} = -0.69$
$\gamma_{15} = 3.30$	$\gamma_{16} = 0.60$	$\gamma_{17} = -0.34$	$\gamma_{18} = 2.31$	$\gamma_{19} = -0.75$
$\gamma_{20} = 1.08$	$\gamma_{21} = 0.01$	$\gamma_{22} = 0.31$	$\gamma_{23} = 3.23$	$\gamma_{24} = -0.57$

Government

Public consumption, which is comprised of the sum of the compensation to public employees and the other operating expenditures, has already been defined in equations (3) and (4). The government subsidies to production and the current transfers to households as part of the social

security network were defined in equations (22) and (28). The government revenues from taxes from households and firms have also already been written in equations (29) and (32). The government pays interest to the private sector and the rest of the world on its stock of outstanding bonds and external debt, respectively. The only component of the social accounting matrix that is left to be defined is nominal public investment (equation [54]). The result of all these current transactions gives the government's net savings (equation [55]).

$$I_t^G = i_t^G p_t^K \tag{54}$$

$$S_t^G = T_t^H + T_t^F + VAT_t + NT_t + AF_t^G - SS_t - OE_t - r_{t-1}^G DD_{t-1} - r_{t-1}^{G*} ED_{t-1}^G E_t + F_t^{CB,G} - GC_t - I_t^G \tag{55}$$

The government has three sources of financing: bonds, advances, and external debt. The latter two are assumed to be exogenous. The possibility of issuing external debt depends on the rest of the world's willingness to purchase domestic assets, which depends mostly on the interest rate adjusted for the risk premium. The direct financing from the central bank through advances is an exogenous decision made by the monetary authority. The supply of domestic bonds is, on the other hand, given by the private sector's portfolio decisions. The buffer that ensures the fulfillment of the government's balance sheet identity is given by the auxiliary stock variable defined in the previous section (equation [56]).

$$\Delta AS_t^G = \Delta DD_t + S_t^G - \Delta D_t^{USD} E_t + \Delta A_t + \Delta ED_t^G E_t \tag{56}$$

Rest of the World

The equation for exports incorporates different variables that, given the specificities of the productive structure of Argentina, are known to have a relevant impact in their determination. The production of primary goods (y^{prim}) is included as an explanatory variable because it reflects the possible supply-side constraints that can determine the volume of exports (for instance, droughts). Brazil's growth rate (y^{BR}) is also an important factor, since many of the manufactured exports are directed to that country. The international price of commodities (p^*) also tends to have a positive impact on exports. The real exchange rate (e) is a usual explanatory variable in this type of equation. In the case of imports, the main determinants are the domestic

level of activity and the real exchange rate. For simplicity, the real exchange rate is defined as the bilateral exchange rate with the US (equation [59]).

$$\Delta\, log(X_t^{USD}) = \mu_0 + \mu_1 \Delta\, log\left(y_t^{prim}\right) + \mu_2 \Delta\, log(y_t^{BR}) + \mu_3 \Delta\, log(p_t^*) + \mu_4 \Delta\, log(e_t) + \mu_5 EC_{t-1}^X \quad (57)$$

$$\Delta log(IM_t^{USD}) = \mu_6 + \mu_7 \Delta log(y_t) + \mu_8 \Delta log(e_t) + \mu_9 EC_{t-1}^{IM} \quad (58)$$

$$e_t = \frac{E_t p_t^{USA}}{p_t^C} \quad (59)$$

Table 10: Exports and Imports Equation Coefficients

$\mu_0 = 0$	$\mu_1 = -0.03$	$\mu_2 = 3.30$	$\mu_3 = 0.21$	$\mu_4 = 0.30$
$\mu_5 = -0.36$	$\mu_6 = 0$	$\mu_7 = 1.47$	$\mu_8 = -0.59$	$\mu_9 = -1.17$

The rest of the world earns interest on its holdings of external debt issued by the private sector and the government. The sum of all the current transactions gives the current account, which is the negative of the savings of the rest of the world. In order to ensure accounting consistency, the current account must be transformed into domestic currency.

$$-S_t^{RW} = CA_t E_t = X_t^{USD} - IM_t^{USD} - r_{t-1}^{P*} ED_{t-1}^P - r_{t-1}^{G*} ED_{t-1}^G - AF_t^{RW} \quad (60)$$

The rest of the world's demand for domestic assets, issued by both the private and public sectors, is considered exogenous. Finally, the change in the rest of the world's supply of foreign assets is such that its balance sheet identity is fulfilled.

$$\Delta FA_t = \Delta ED_t^P + \Delta ED_t^G + \Delta ED_t^{CB} + CA_t + \Delta AS_t^{RW} \quad (61)$$

Once the external sector of the economy has been coherently defined, it is possible to derive the nominal exchange rate as an accounting identity that ensures the fulfillment of the line that defines the market for foreign assets. This closure of the model is identical to the flexible exchange rate closure proposed by Godley and Lavoie (2007: ch. 12).

$$E_t = \frac{FA_t^P}{FA_t - FA_t^{CB}} \quad (62)$$

Central Bank

The central bank's savings are given by the difference between its income and outlays arising from interest payments. In this simplified description of the central bank, the only component of its savings are the interest payments that it pays to the private sector on its holdings of bills and the share of its profits that are transferred to the government.[37]

$$S_t^{CB} = -r_{t-1}B_{t-1} - F_t^{CB,G} \quad 63)$$

The central bank's stock of external debt is assumed to be exogenous. The advances provided to the government and the net acquisition of foreign assets are defined as policy tools of the central bank. In the case of advances, they can be used to relieve the government's need to issue bonds as a source of financing. In the case of the net acquisition of foreign assets, it can be used to pursue a certain exchange rate policy. The greater the purchases or sales of foreign reserves by the central bank, the greater its willingness to defend a certain level of the nominal exchange rate. Times of large purchases (sales) of foreign reserves can be interpreted as times of liquidity (scarcity) of foreign exchange in the domestic market and, thus, as situations where market forces produce nominal exchange rate appreciation (depreciation). The relationship between the change in the stock of foreign reserves and the nominal exchange rate can be observed in equation (62).

Since the central bank's external debt, advances, government deposits, foreign reserves, bills, and money are already given, there is no variable that can ensure that its balance sheet identity is fulfilled. As happens in every SFC model, the fulfillment of this equation should be logically derived from the n-1 equations of the model. This accounting relation is thus used to check the overall consistency of the model.

[37] The component that explains the possibility of the central bank having a positive profit is the capital gains that arise from its holdings of foreign reserves (as shown in the revaluation matrix presented in section 4). When the exchange rate depreciates, the central bank can monetize these capital gains and transfer the resulting funds to the government.

$$S_t^{CB} + \Delta D_t^{USD} E_t + \Delta ED_t^{CB} E_t + \Delta H_t + \Delta B_t - \Delta FA_t^{CB} E_t + \Delta A_t - \Delta AS_t^{CB} = 0$$

Prices

The last component of the model that needs to be defined are the price indices, presented in equations (54–58). The estimation of the consumption deflator, which is taken as a proxy for the consumer price index, builds upon the previous work of Trajtenberg, Valdecantos, and Vega (2015) and Zack, Montané, and Kulfas (2018), who explicitly identify some of the supply-side determinants of price dynamics.

$$\Delta log(p_t^C) = \beta_0 + \beta_1 \Delta log(p_{t-1}^C) + \beta_2 \Delta log(ulc_t) + \beta_3 \Delta log(E_t) + \beta_4 \Delta log(p_{t-1}^R) + \beta_5 \Delta log(p_t^*) + \beta_6 \Delta log(u_{t-2}) + \beta_7 EC_{t-1}^{PC} \quad (64)$$

$$\Delta log(p_t^X) = \beta_8 + \beta_9 \Delta log(p_t^C) + \beta_{10} \Delta log(E_t) + \beta_{11} \Delta log(p_t^*) + \beta_{12} EC_{t-1}^{PX} \quad (65)$$

$$\Delta log(p_t^{IM}) = \beta_{13} + \beta_{14} \Delta log(p_t^{USA}) + \beta_{15} \Delta log(E_t) + \beta_{16} EC_{t-1}^{PM} \quad (66)$$

$$\Delta log(p_t^K) = \beta_{17} + \beta_{18} \Delta log(ulc_t) + \beta_{19} \Delta log(E_t) + \beta_{20} \Delta log(r_{t-1}) + \beta_{21} \Delta log(p_t^R) + \beta_{22} EC_{t-1}^{PK} \quad (67)$$

$$\Delta log(p_t^G) = \beta_{23} + \beta_{24} \Delta log(w_t^G) + \beta_{25} \Delta log(L_t^G) + \beta_{26} \Delta log(i_t^G) + \beta_{27} \Delta log(GC_t) + \beta_{28} EC_{t-1}^{PG} \quad (68)$$

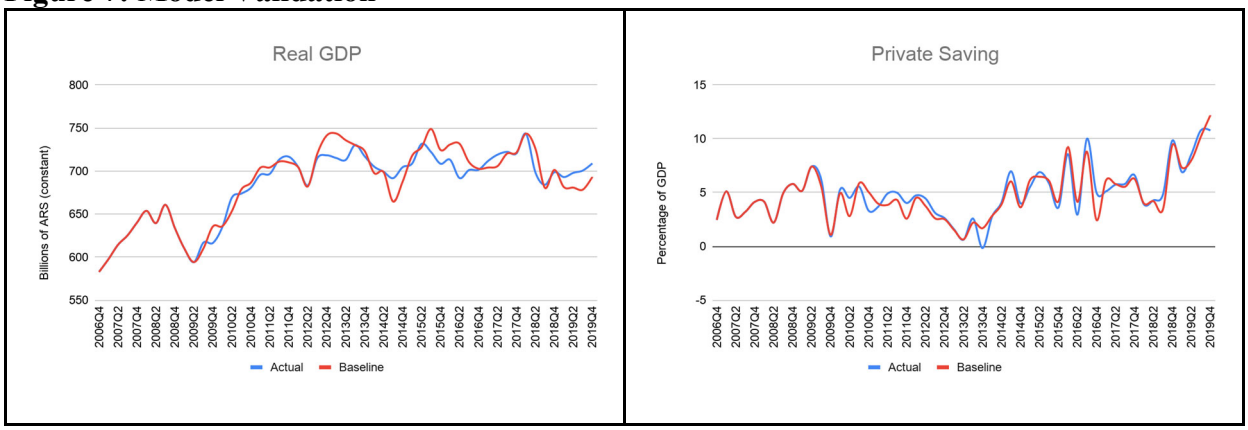
Table 11: Price Equation Coefficients

$\beta_0 = 0$	$\beta_1 = 0.28$	$\beta_2 = 0.52$	$\beta_3 = 0.14$	$\beta_4 = 0.11$
$\beta_5 = -0.01$	$\beta_6 = 0.42$	$\beta_7 = -0.81$	$\beta_8 = 0$	$\beta_9 = 0.40$
$\beta_{10} = 0.75$	$\beta_{11} = 0.26$	$\beta_{12} = -0.13$	$\beta_{13} = 0$	$\beta_{14} = 1.92$
$\beta_{15} = 0.84$	$\beta_{16} = -0.31$	$\beta_{17} = 0$	$\beta_{18} = 0.43$	$\beta_{19} = 0.31$
$\beta_{20} = 0.05$	$\beta_{21} = 0.11$	$\beta_{22} = -0.29$	$\beta_{23} = 0$	$\beta_{24} = 0.95$
$\beta_{25} = -1.26$	$\beta_{26} = 0$	$\beta_{27} = 0.10$	$\beta_{28} = -0.40$	

Equations (1–68) define the dynamic system that solves the model represented in the transactions flow matrix presented in table 3. The exogenous variables used to solve the model, both the ones defined as policy tools and the ones that are beyond the control of the government, are either obtained from official data sources or computed implicitly, as was described in the previous section. The model's parameters were estimated econometrically, as is presented in the appendix. Figure 7 illustrates the model's capacity to reproduce the actual dynamics of GDP and private wealth[38] (the scenario consists of the model's solution for the endogenous variables considering the actual values for the exogenous variables). As is observed, its fit seems to be very good, which suggests that the model is capable of providing valid approximations of the dynamics of the Argentinean economy (at least, for carrying out simulation exercises).

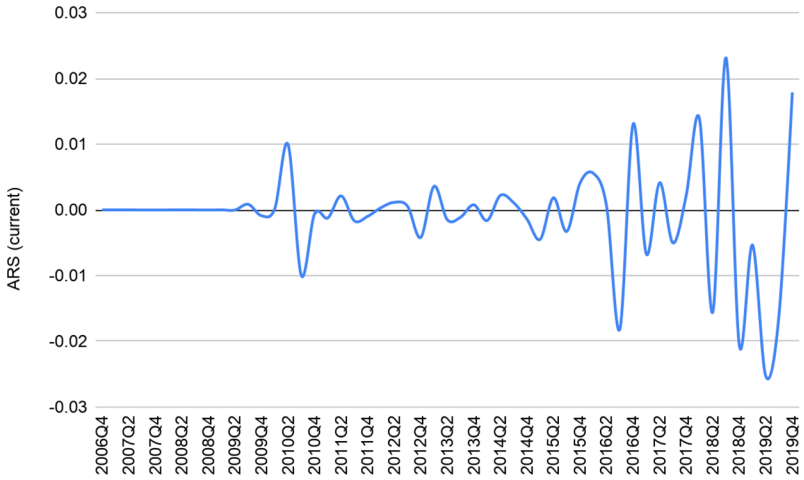
[38] The model's capacity to track the actual trajectory of a variable can be tested for any of the model's endogenous variables. For the sake of simplicity only the model validation for GDP and private saving are presented. These are two variables are among the most endogenous variables of the model, as they are entirely composed of other endogenous variables—some of them behavioral and some of them accounting identities.

Figure 7: Model Validation



In figure 8 we plot the model's missing equation, i.e., the one describing the central bank's balance sheet identity. As the graph shows, the structure of the model defined in this section fulfills the stock-flow consistency requirements upon which this modeling approach is built.

Figure 8: Consistency of the Model



6. SIMULATIONS

Now that the model has been built and validated, the four research questions posed in section 3 can be addressed. This requires simulating a scenario where some of the exogenous variables or parameters are changed according to the underlying proposal. For the first two simulations the sample that ranges from 2012Q1 to 2015Q4 is taken, i.e., the whole second mandate of

Fernández de Kirchner. In an attempt to examine what the macroeconomic performance could have been if the government had followed the prescriptions implied in each proposal, the exogenous variables are changed in the first simulation period.

Question 1: The New Keynesian Shock

The New Keynesian critique to the macroeconomic program pursued during the period 2012–15 implies the following policy changes:

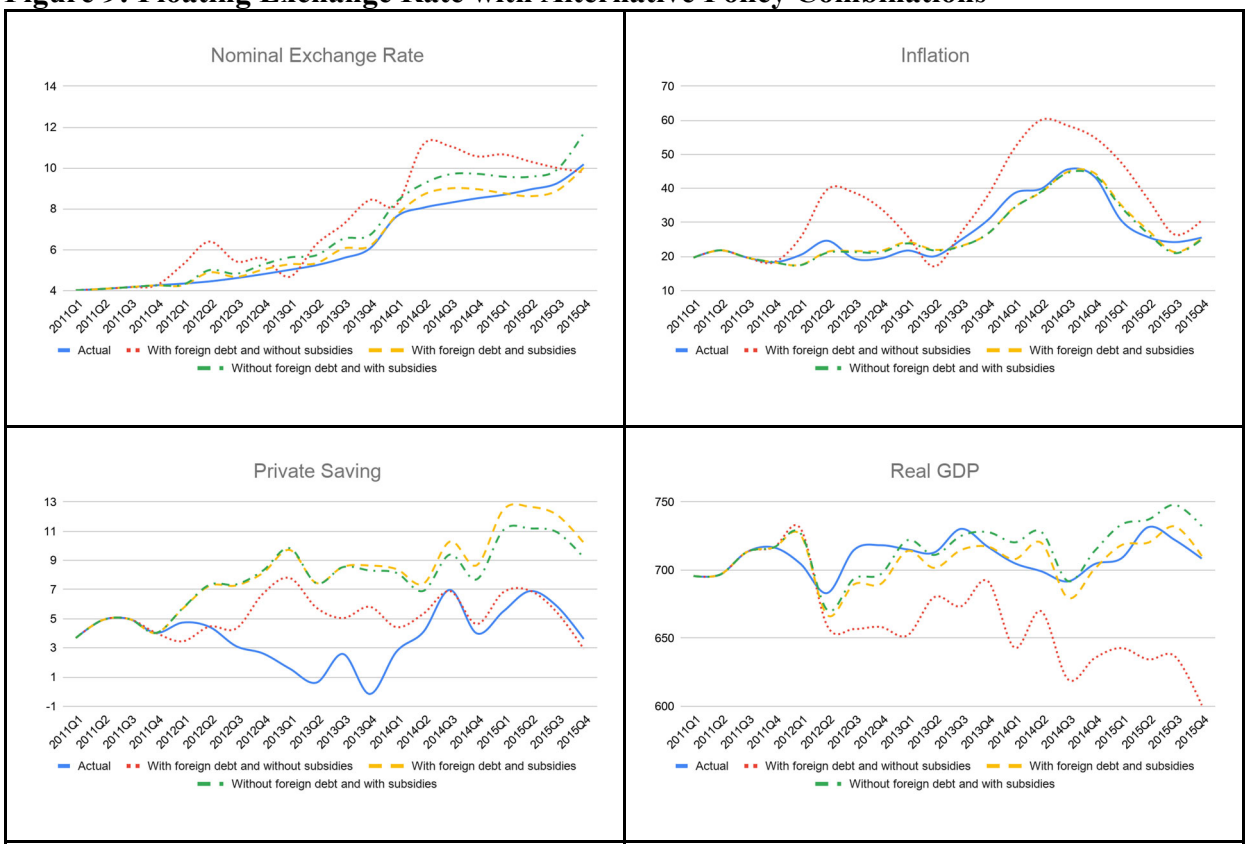
- Not imposing any type of capital controls[39] ($controls^{S1} = 0$)
- Reducing sharply or eliminating the subsidies on utilities ($s^{S1} = 0.2$)
- Increasing the interest rate such that the real interest rate is positive ($r^{S1} - \pi^{S1} > 0$)
- Establishing a floating exchange rate regime ($FA_t^{CB^{S1}} = \underline{FA^{CB}}$)
- Resuming financial integration via public foreign indebtedness ($ED_t^{G^{S1}} = ED_{t-1}^{G,S1}\,1.05$)

The results of these policy changes are summarized in figures 10–12. But before analyzing the impacts of the whole economic policy package it is useful to examine the behavior of the model when only some of its components are implemented. In figure 9, we present the trajectories of the nominal exchange rate and inflation when a flexible exchange rate regime is established (i.e., when capital controls are not implemented and when the central bank does not intervene in the foreign exchange market) in 2012Q1. This floating regime is tested with the complete set of policies defined above and also without the reduction of subsidies and increase in foreign indebtedness. Since there are no capital controls preventing the private sector from acquiring foreign assets and because the central bank does not meet this demand by selling foreign reserves, the nominal exchange rate depreciates in all cases. However, the size of these movements varies. The highest depreciation is registered in the scenario where subsidies are removed, which is reasonable taking into account its inflationary effect and the sensibility of the private sector's demand for foreign assets. Given a certain amount of foreign financing and assuming no central bank interventions, the demand for foreign assets translates into a higher exchange rate. As a result, inflation (plotted in the top-right panel) surges and reaches a higher

[39] Capital controls are defined as a dummy variable that takes the value of 1 between 2012Q1 and 2015Q4. This variable is included in the long-term equations of the exchange rate, the residual of which is explicitly written in the short-term relation as reflected in equation (59).

rate than in the rest of the scenarios. In the medium run, however, this scenario stabilizes as the disinflation process reduces the acquisition of foreign assets. The oscillatory behavior of inflation is explained by the upward pressure that depreciations put on prices and the subsequent downward nominal wage adjustments that take place as a result of the contractionary effect of depreciations. Private savings exhibit better performance than in the actual scenario due to the positive effect that the contractionary devaluation has on the current account.

Figure 9: Floating Exchange Rate with Alternative Policy Combinations



The two scenarios where the flexible exchange rate is combined with the maintenance of the utility regulation policy (one with the external indebtedness, the other one without it) look very similar, the main difference being the relatively lower exchange rate that the availability of external financing implies. The evolution of private savings in these two cases exhibits a better performance than in the previous scenario, as the subsidies on utilities prevent the increase in inflation, the depreciation of the exchange rate (which still depreciates a bit as a result of the exchange rate regime switch), and the reduction in the level of activity. In this case, the

counterpart of the increase in private savings is partly given by the improvement of the current account and the worsening of the budget balance of the government.

Unsurprisingly, these alternative policy combinations have different impacts on GDP. A first effect that should be taken into account considering the stylized facts of the Argentinean economy is the contractionary effect of devaluations. The avoidance of any type of capital control added to the establishment of a floating exchange rate regime produces an increase in the exchange rate. Although the devaluation induces an increase in exports[40] (which explains the temporary increase in GDP observed in 2012Q1) the overall effect is contractionary. The channel is the one described by Díaz-Alejandro (1963) and Krugman and Taylor (1978), and is reflected in the evolution of inflation in the top right panel of figure 9. However, this contractionary effect is much larger when subsidies are removed (because it induces higher inflation in the long term, which adds to the upward pressure that the devaluation puts on the price level) and when there is no external financing (because the size of the devaluation is larger in the short term, as the market for foreign assets is entirely closed by a price adjustment). The only case where the opening of the capital account and the establishment of a flexible exchange rate minimizes the contractionary effect of the devaluation is when subsidies are kept and capital inflows offset the demand for foreign assets of the private sector.

After having inspected the behavior of the model under different policy combinations, we focus on the specific scenario described before, i.e., the one that describes the New Keynesian critique to the policies actually implemented in the period 2012–15. The avoidance of any type of capital control added to the establishment of a floating exchange rate regime produces a devaluation, which is observed in the top-right panel of figure 10. Although the devaluation induces an increase in exports, the overall effect is contractionary due to the inflationary impact of the depreciation. The increase in inflation also obeys to the removal of subsidies on utilities, which ends up increasing their price and, therefore, the price of final goods. The nominal exchange rate exhibits a depreciating trend as a result of the aforementioned impulse mechanisms and also due to the increasing inflation and public foreign indebtedness which, as described in the

[40] The positive relationship between the real exchange rate and exports needs not be explained through an increase in the sales of manufactured goods to foreign markets, but by the liquidation of primary exports that are often accumulated as a stock to be sold only once a devaluation has occurred, thereby making a capital gain.

previous section, tends to be positively related to depreciations. However, there are periods where the exchange rate seems to stabilize as the rate of inflation diminishes, presumably reducing the private sector's demand for foreign assets.

It is also remarkable that while a program like this tends to be associated with the desirable conditions for *doing business*, investment shows a sharp decline. Several factors explain this poor performance: higher interest rates, negative growth (which negatively affects investment through the accelerator effect), and exchange rate depreciation. The sum of these three effects ends up outweighing the positive impact of the increased profit rate, which is mostly driven by the increase in prices.

As inflation accelerates and both the private real wage and employment decrease, income distribution worsens, as shown in the bottom-left panel of figure 10. Although private wages dynamically adjust to the increase in prices, they do it with a lag. The situation of wages in the public and informal sector is harder. Moreover, employment is reduced as a result of the decline in economic activity, thereby reducing the bargaining power of workers and their capacity to maintain the purchasing power of the nominal wage. The wage share tends to recover when the inflation rate diminishes or stabilizes, as observed toward the end of the sample, which gives real private wages more room for recovering. The main driver of the oscillatory behavior of the inflation rate is unit labor costs (and more specifically private wages), which follows the evolution of inflation and level of activity. For instance, the disinflation observed from mid-2014 to the end of 2015 is determined by the deceleration in the rate of increase of nominal wages induced by the reduction in employment. The real exchange rate, for its part, exhibits an oscillatory behavior explained by the dynamics of the nominal exchange rate and prices, which asynchronously push the real exchange rate into opposite directions (as observed in the bottom-right panel of figure 10). Until 2014, the real exchange rate in the scenario is, on average, above the level of the actual level, which allows for slightly higher exports than in the baseline.[41]

[41] It should be noted, however, that the better performance of the current account in the scenario is also explained by the reduction in imports, which fall all over the simulation in line with the drop in output.

Figure 10: New Keynesian Shock

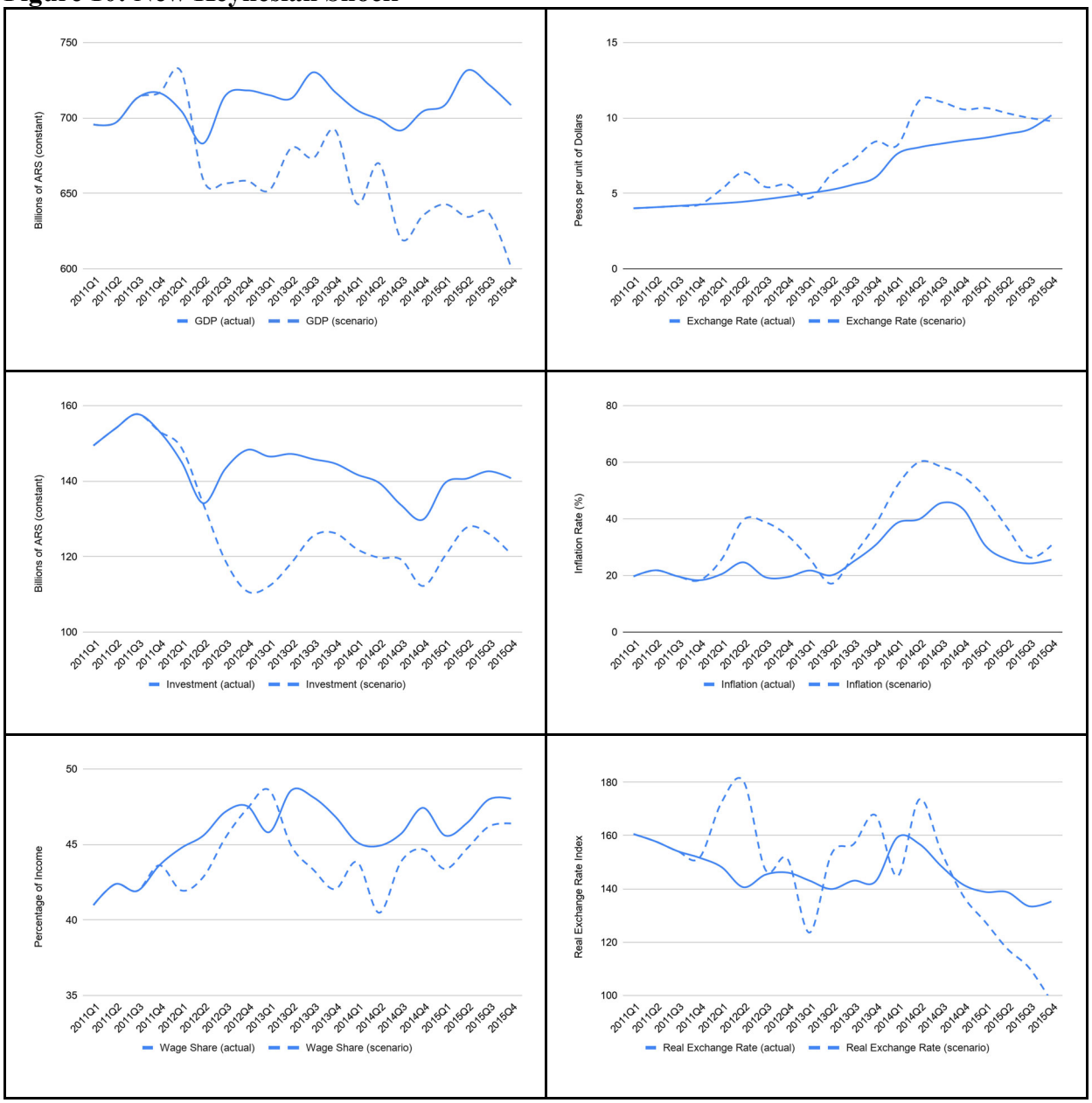
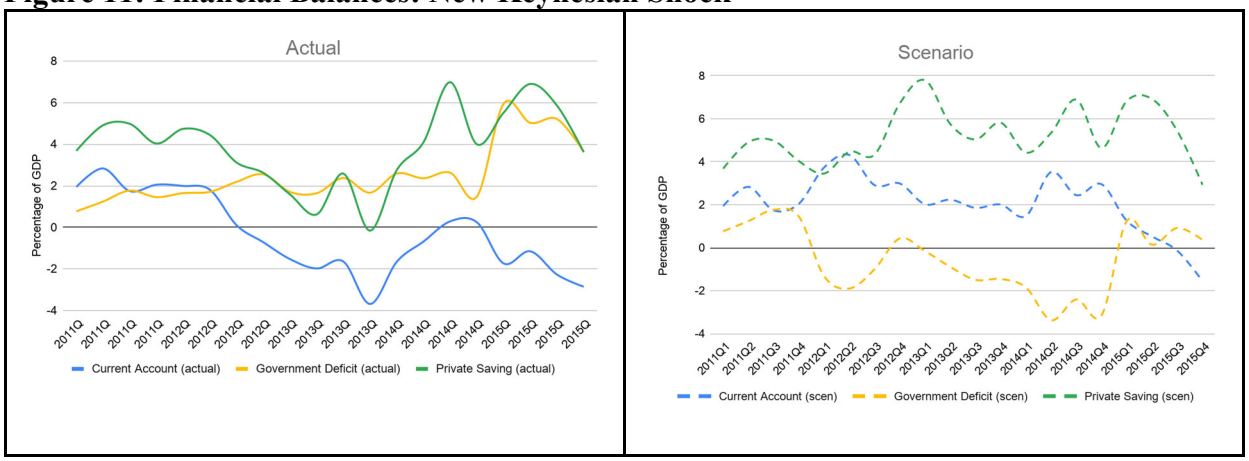


Figure 11 plots the evolution of the sectoral financial balances, both for the baseline (the actual values for the period 2012–15) and the simulated scenario. The most salient feature of the simulations is that, as expected, the government's financial balance improves significantly (as a result of the removal of subsidies). Although initially the improvement in the fiscal balance negatively affects private saving, after some periods the dynamics produced by this policy

program seem to be in line with the New Cambridge approach.[42] As a result, the current account maintains the surplus position that was lost in the baseline, although the price of the preservation of the external equilibrium seems to be the deep economic contraction, as reflected in the top-left panel of figure 10. The government's financial balance stabilizes around a surplus of 2 percent of GDP until the beginning of 2015, where there is an exogenous increase in public spending both in the baseline and in the simulated scenario.[43]

Figure 11: Financial Balances: New Keynesian Shock



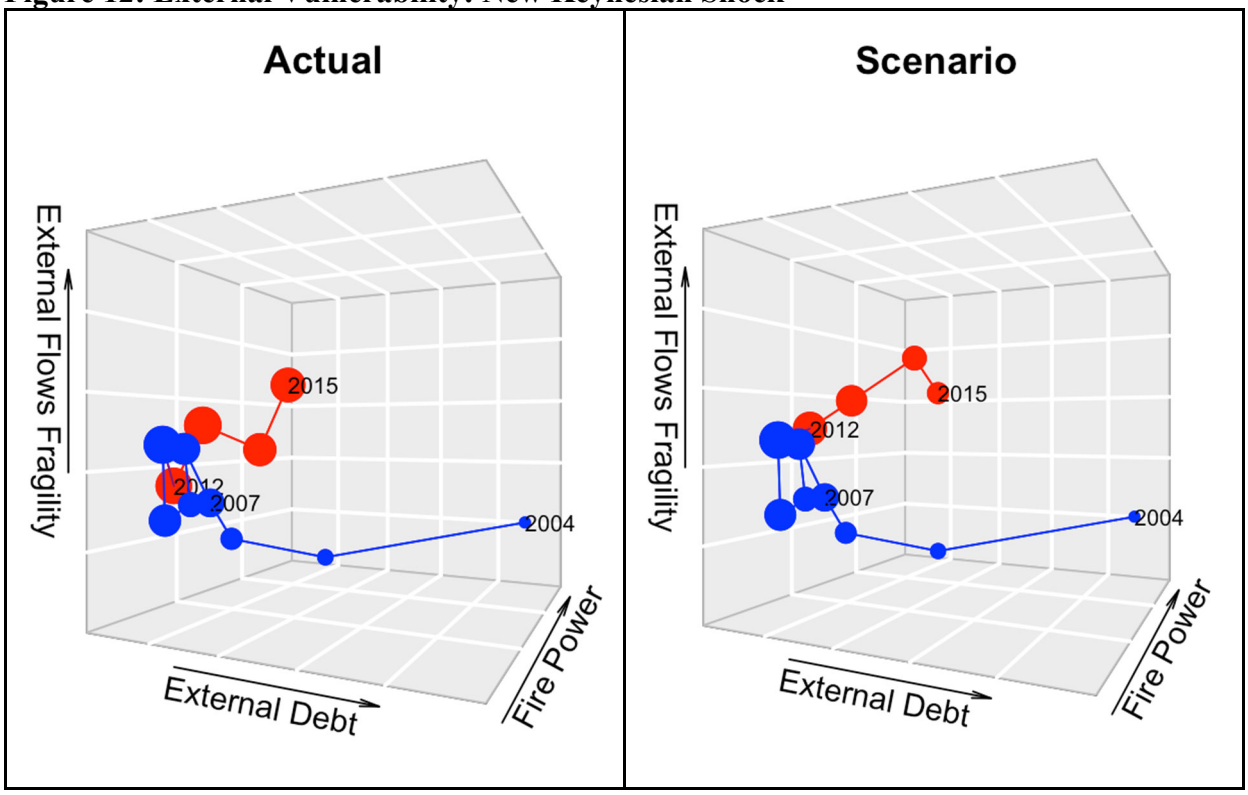
The fact that the government is running a surplus all along the simulation while simultaneously increasing its foreign indebtedness implies a reduction of the public debt denominated in domestic currency, which is, in turn, an asset for the private sector. This is made possible by the fact that the increasing inflation discourages the private sector from accumulating its wealth under the form of bonds denominated in domestic currency. However, since the private sector is running a surplus over almost the whole simulation, it must be the case that there is another component of the balance sheet that is increasing—both to compensate for the decrease in its holdings of bonds and to account for its positive saving. The component that balances the private sector's budget constraint is the acquisition of foreign assets, which is not only coherent with the features of the scenario (removal of capital controls, high inflation, etc.) but also with the fact that since it is running a deficit, the rest of the world must be increasing its liabilities

[42] According to this approach, put forward by Fetherson and Godley (1978) and Godley and Cripps (1983), the private sector's financial balance tends to be small, thereby inducing a mirror effect between the government deficit and the current account.

[43] The sudden reduction of the government surplus in the beginning of 2015 follows the increases in both current and capital expenditures, which are, in turn, sources of income for the private sector. Since these factors are not modified in the simulation, the effect applies both for the baseline and the scenario.

within the economy. This is how the balance sheets of the economy's three sectors coherently balance each other out, thereby ensuring the accounting consistency of the model.

Figure 12: External Vulnerability: New Keynesian Shock



Regarding external vulnerability, figure 12 shows that while in the baseline there was a gradual deterioration that resulted from a combination of a leak of foreign exchange on the side of the current account (external flows fragility axis), mostly explained by the trade deficit, and a reduction of the central bank's firepower due to the decrease of foreign reserves and the increase of short-term bills, in the scenario the situation is somewhat different. First, there was an increase in the current outflows in 2012 as the capital controls were relieved. Afterwards, the economy situates at higher levels of foreign exchange leakages as the private sector's acquisition of foreign assets is larger than the current account surplus that this scenario brings about. As regards external debt, by the end of the simulation the economy finds itself around 41 percent of GDP, which is almost double the level of the baseline but is still a low level in historical terms. In terms of room for maneuver, the firepower index is slightly lower (i.e., in a better shape) than in the baseline due to the fact that foreign reserves are not used to defend a certain parity. However, the central bank's greater firepower that the larger stock of foreign

reserves implies is compensated for, though not entirely, by an increase in the private sector's holding of short-term assets (central bank bills and money, which are the buffer of the private sector's budget constraint). The result of this higher external financial fragility is that by the end of the simulation the size of the economy (represented by the size of the dots) is 12 percent smaller compared to the baseline.

In sum, in the light of the model it seems that having applied an adjustment program around 2012 along the lines of the New Keynesian model would have given the economy more external sustainability from the perspective of the current account balance (mainly through the reduction in imports that the recession would have brought about), but not necessarily if external financial flows are taken into account: first, because the lack of capital controls would have produced continuous outflows as a result of the private sector's acquisition of foreign assets; and second, because the process of foreign indebtedness would have laid the foundations not only for interest payments but also for the feedback effect on the private sector's acquisition of foreign assets. Besides the external vulnerabilities that this model would have produced, the negative impacts on the real side of the economy would have been strong, mainly on investment. The only aspect in which, according to the model, this program could have produced superior results compared to the baseline is on the fiscal front, where the reduction of public spending (on subsidies on utilities) would have more than compensated for the endogenous drop in taxes. Thus, such a program should only be considered if the government budget equilibrium or surplus is taken as the main (or sole) goal of macroeconomic policy.

Question 2: The New Developmentalist Proposal

The New Developmentalist proposal derived from the critique to the macroeconomic program pursued during the period 2012–15 implies the following policy changes:

- Setting the real exchange rate around a "competitive" rate, which is achieved through the sales and purchases of foreign reserves by the central bank ($FA_t^{CB^{S2}}$ endogenous)
- Not imposing any type of capital controls ($controls^{S2} = 0$)
- Reducing the subsidies to the provision of utilities ($s^{S2} = 0.4$)

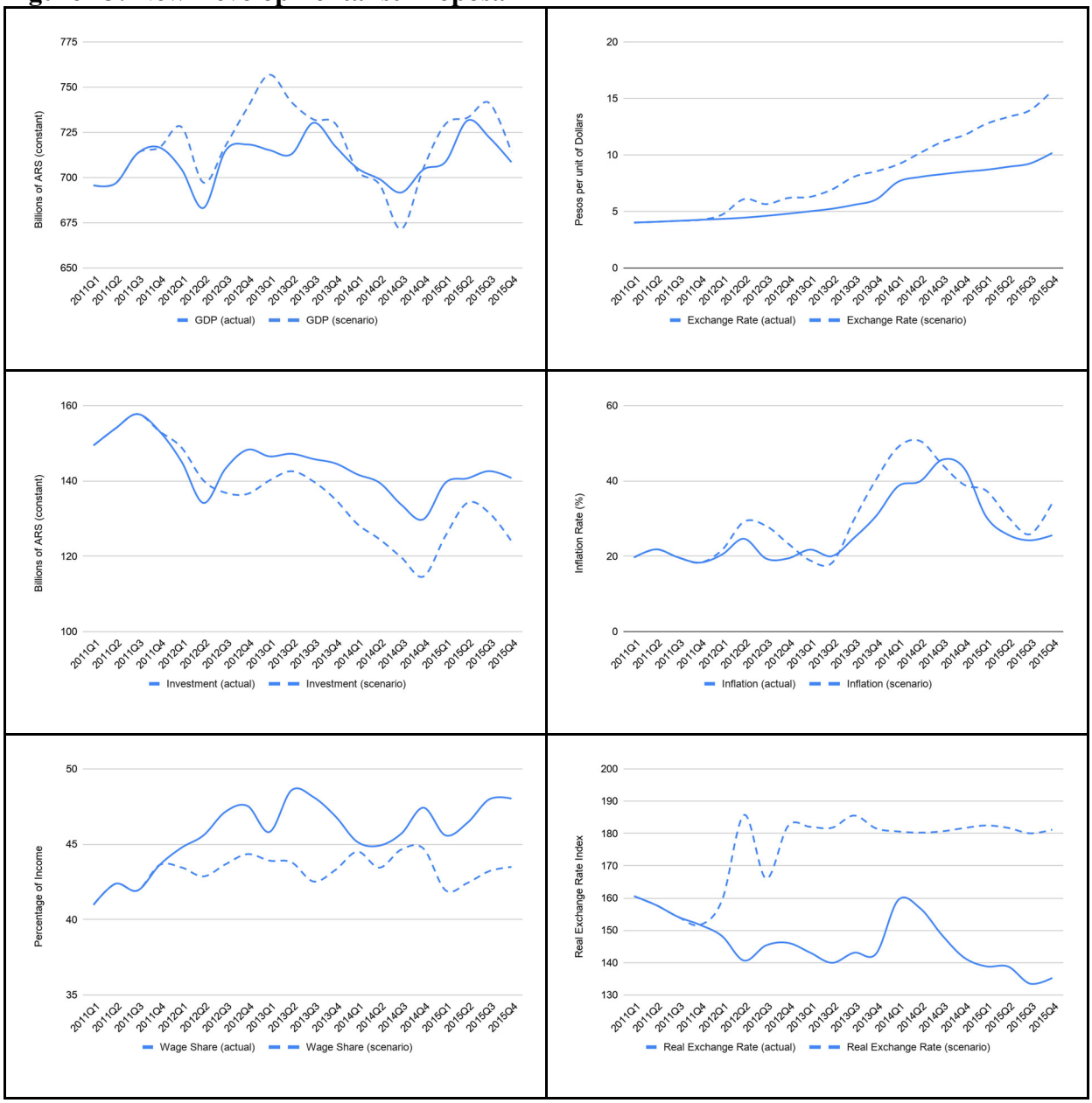
- Increasing the interest rate such that the real interest rate is slightly positive ($r^{S1} - \pi^{S1} > r^{S2} - \pi^{S2} > 0$)
- Resuming financial integration through public foreign indebtedness, although at a lower intensity compared to the previous scenario ($ED_t^{G^{S2}} = 1.05\ ED_t^{G,actual}$)

The establishment of a target real exchange rate at "competitive levels" can be observed in the bottom right panel of figure 13, where after an initial adjustment period it finally settles around the levels observed in the period 2004–8. As the top-left panel of figure 13 shows, in the beginning of the simulation the effect on GDP seems to be positive compared to the baseline, the main reason being the increase in net exports. The depreciation of the exchange rate induced by the removal of the capital controls reduces imports significantly, mostly through the real exchange rate channel. The higher exchange rate also boosts exports (ceteris paribus with Brazil's growth), which are the main driver of the GDP growth observed until midway through 2013. As inflation starts accelerating, the central bank induces an exchange rate depreciation such that the real exchange rate is kept constant. Consequently, private consumption drops as a result of the devaluation's contractionary effects (which adds to the upward pressure that the reduction in subsidies has on prices). These dynamics are also strengthened by the endogenous behavior of private investment, which decreases in line with the drop in capacity utilization (middle-left panel of figure 13). In the medium run, the contractionary effects of this program seem to balance out with the expansionary ones, implying that a virtuous combination of policies could potentially exist, allowing the economy to grow at a decent rate without necessarily entailing a balance of payment disequilibrium.

Compared to the previous scenario, the devaluation in real terms is larger, which implies that income distribution worsens to a larger extent (bottom-left panel of figure 13). The establishment of a target for the real exchange rate implies that the nominal exchange rate depreciates at a roughly constant rate (top-right panel of figure 13). The persistent depreciation of the exchange rate implies a permanent impulse to the dynamics of prices (which are also fueled by inertia) and the increase in the price of utilities (which results from the reduction of subsidies). The oscillatory dynamics of the inflation rate are mostly driven by the behavior of unit labor costs, which are in turn determined by the private wage. Given the bargaining power

of unions (which is quite high in Argentina), wages exhibit a high capacity to track the trajectory of prices. When the level of employment is high, as it happens in this scenario, the wages' reaction to the movements in prices can be even stronger, which ends up feeding back into the price dynamics. According to these dynamics, the trajectory of prices produced in this scenario seems to be explained by the theory of inflation's conflicting claims.

Figure 13: New Developmentalist Proposal

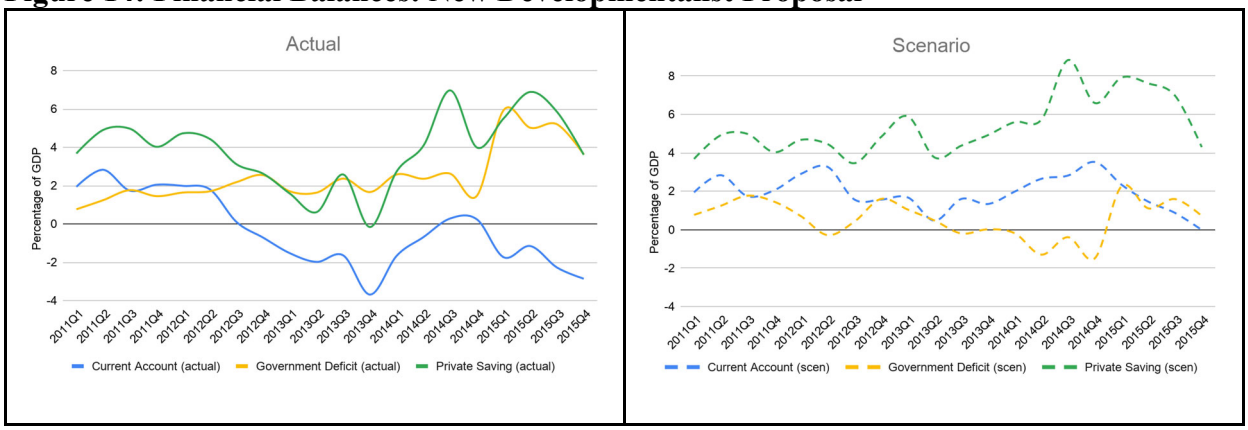


A first look at the financial balances of the aggregate sectors (figure 14) shows that the evolution of private saving is very similar to the baseline, which implies that the changes in the current account should mirror the changes in the government's financial balance (although the causality could go in either direction). The inversion of the trajectories of these financial balances are in line with the New Cambridge approach's conclusions. The establishment of a target real exchange rate at a level that is higher relative to the baseline prevents the current account from turning negative. The better performance of the current account is not only explained by the increase in exports, but also by the endogenous reduction in imports that the recession brings about. Among the determinants of the drop in consumption is the removal of subsidies, which apart from improving the current account (through the lower imports that result from the decrease in the private sector's purchasing power) contributes to the increase in the budget surplus. In the beginning of 2015, these dynamics were changed by the exogenous increase in the government's current and capital transfers to the private sector,[44] which further improve private savings while taking the fiscal balance into a deficit position. Although this behavior is partially reversed in the periods following 2015, it is not enough to restore the budget balance. As a result, the current account surplus is reduced, although it remains at a higher level compared to the baseline.

As regards the implications of the financial balances on these sector's balance sheets, the most salient result is that the combination of the government's balanced budget with the soft increase in foreign indebtedness reduces the financing needs in domestic currency. Hence, the stock of bonds held by the private sector is reduced accordingly. The increasing wealth of the private sector is accumulated mostly under the form of foreign financial assets, central bank bills, and money, which act as the buffer that ensures the consistency between the stocks and flows of the private sector. As it was the case in the baseline, the increase in the stock of foreign assets—which is in turn the liability of the rest of the world that increases to ensure the fulfillment of its budget constraint—is possible because the capital controls are not established.

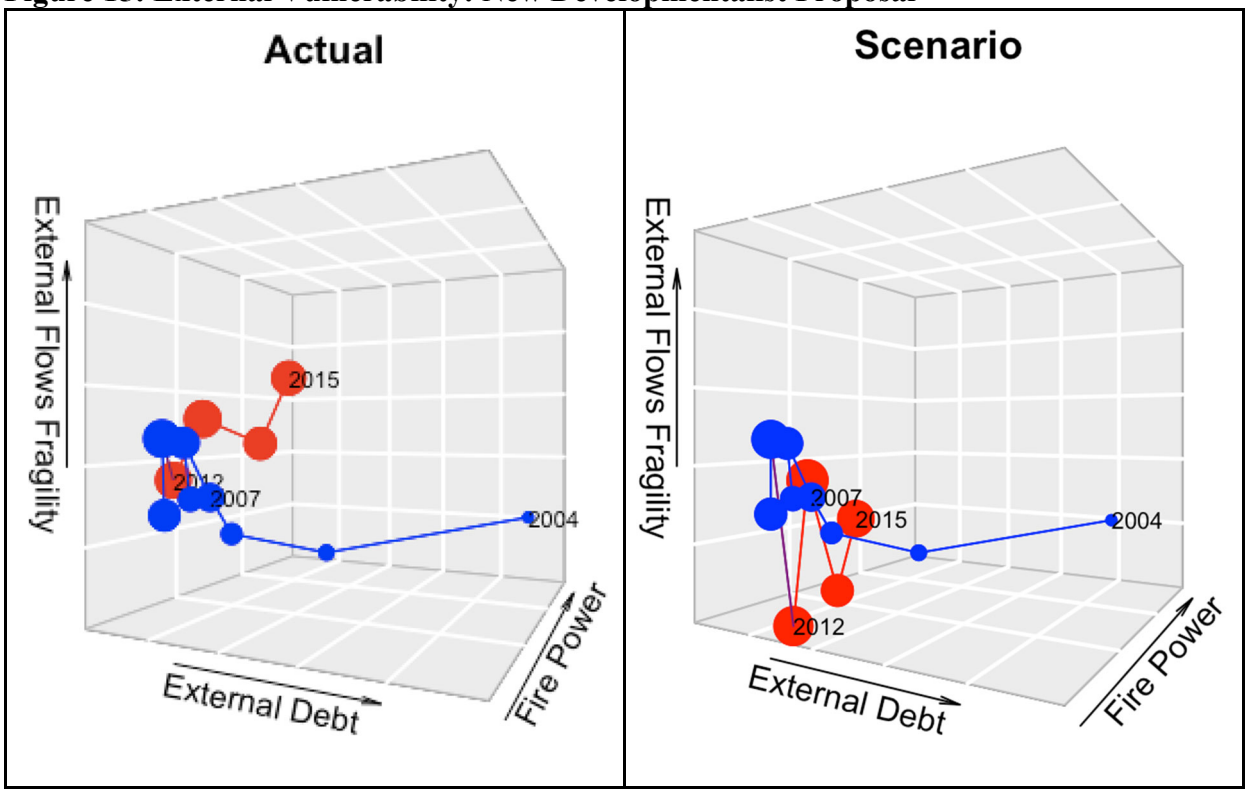
[44] Recall that these exogenous changes are not part of the policy program but the reproduction of fiscal behavior observed in 2015. When this exogenous increase in public spending is removed, the trajectories of the financial balances keep the dynamics registered until 2014.

Figure 14: Financial Balances: New Developmentalist Proposal



In this second scenario the economy's external vulnerability is lower, thereby suggesting that the underlying proposal might be more sustainable from the perspective of the balance of payments. The improvement in the current account balance induced by the real exchange rate depreciation is strengthened by a lower acquisition of foreign assets by the private sector, thereby reducing the external flow fragility indicator. The driver of the reduction in the demand for foreign assets is the decrease in exchange rate volatility. Thus, even if in this scenario capital controls are removed, the combination of external financing with the relative stabilization of the exchange rate seems to keep the acquisition of foreign assets below the previous scenario's unstable levels. The central bank's firepower is also increased as a result of the accumulation of foreign reserves enabled by the accumulation of current account surpluses in a context where the central bank targets a competitive value of the real exchange rate. This better performance in terms of external vulnerability prevents the economy from suffering the balance of payments crises that ultimately keep the economy stuck at (average) low growth rates. However, the better performance that the economy shows in terms of growth and balance of payments does not come without a cost, as the deterioration of the wage share shown in figure 13 illustrates. The trade-off between economic growth, income distribution, and external sustainability found in this scenario seems to be in line with the economic cycles that the Argentinean economy has gone through since the 1950s.

Figure 15: External Vulnerability: New Developmentalist Proposal



Question 3: The New Keynesian Internal Critique

Taking the critique that Sturzenegger (2019) makes to the New Keynesian program implemented in the period 2016–19, it is possible to create a scenario with the following features, which according to that theory would have produced better macroeconomic performance:

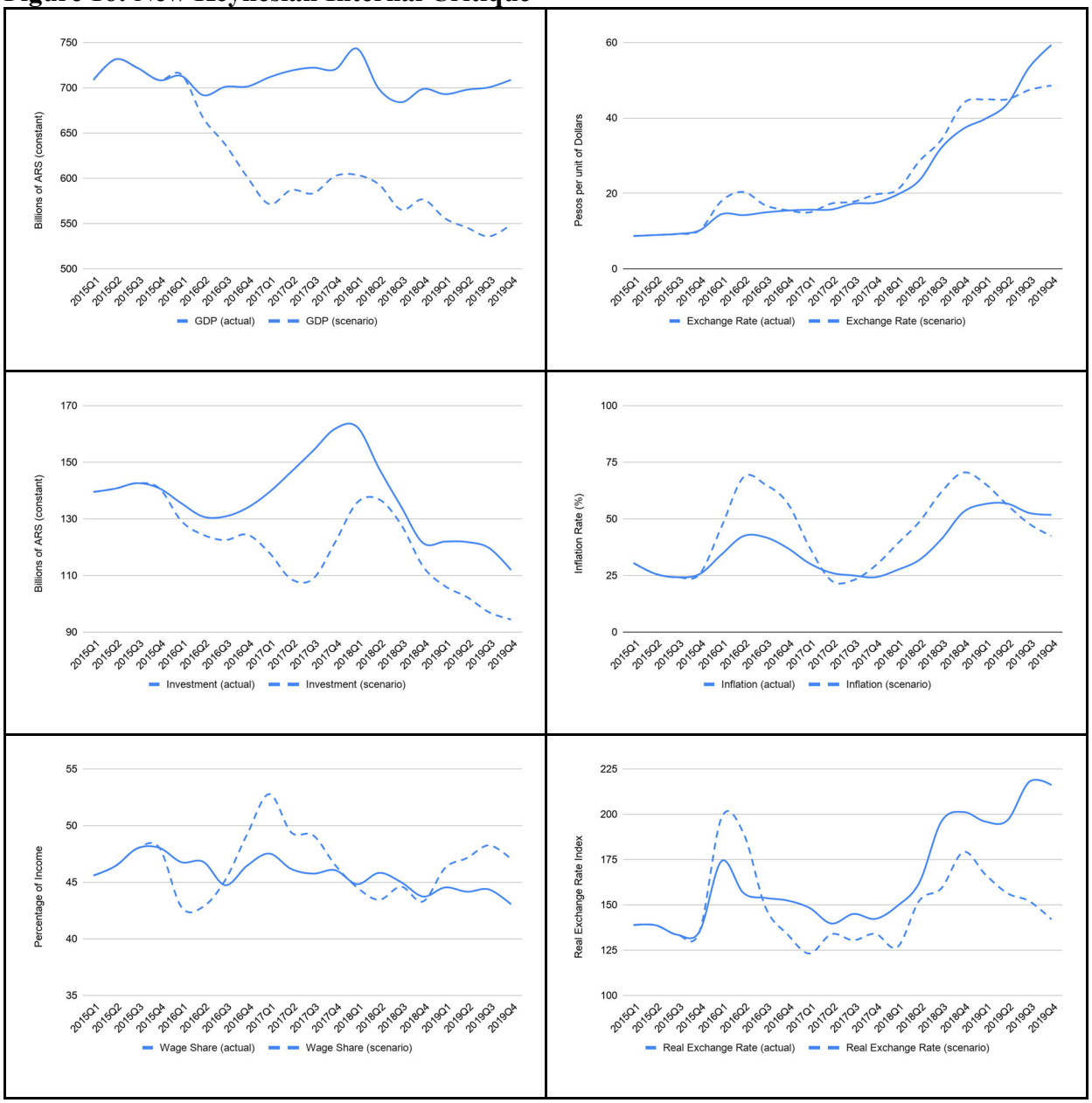
- A higher interest rate for the period 2016 and 2017, keeping it at a level around 40 percent and thereby avoiding the actual reduction registered during those periods
- A stronger reduction of subsidies to utilities ($s^{S3} = 0.5s^{actual}$)
- A reduction in the average allowance paid to the beneficiaries of the social security programs ($AL^{S3} = 0.75AL^{actual}$)
- A reduction in public employment ($L^{G^{S3}} = 0.9L^{G^{actual}}$)

The effect of the combination of these policies on GDP is straightforward: there is a drastic reduction as a result of the slump in private consumption and investment. Several factors explain the drop in consumption. First, the reduction in the subsidies on utilities produces an increase in prices, which reduces households' purchasing power. Second, the reduction of cash transfers also decreases disposable income. Third, the reduction in public employment further reduces the wage bill. The impact of the exchange rate on prices varies along the simulation according to the former's behavior. In the beginning, after an initial devaluation triggered by the effect of the jump in prices on the demand for foreign assets, the nominal exchange rate seems to follow the trajectory of the baseline. A few periods after it appreciates as inflation (which has a direct impact on the demand for foreign assets and the consequent pressures on the exchange rate) and private wealth are reduced. Toward the end of the simulation it depreciates as inflation accelerates again.

Inflation's behavior is similar to that observed in the previous scenarios, even if the sample period is different: after an initial supply-side shock there is an increase in the private sector's demand for foreign assets as a way of keeping its wealth safe from inflation. Since the central bank does not intervene, the exchange rate depreciates, thereby fueling the inflationary process. Eventually the nominal exchange rate stabilizes at a new (higher) level as private saving and, hence, the demand for foreign assets, decreases. Also, the reduction in the growth rate of nominal wages, mostly explained by the drop in employment, softens the inflationary pressures. However, by mid-2017, inflation accelerates again as employment stabilizes and wages start catching up to prices. The increase in the rate of inflation translates, once again, into a higher demand for foreign assets, which eventually ends up inducing an exchange rate depreciation.

Regarding investment, its reduction obeys to the increase in the interest rate, the reduction in the rate of capacity utilization, and the decrease in the profit rate, these latter two being a direct consequence of the recession. Income distribution oscillates around the baseline, while the real wage, employment, and labor productivity fall along all the sample. The reason underlying this result (while income distribution could have been expected to worsen univocally) is that there are periods where the decrease in labor productivity is larger than the drop in the real wage.

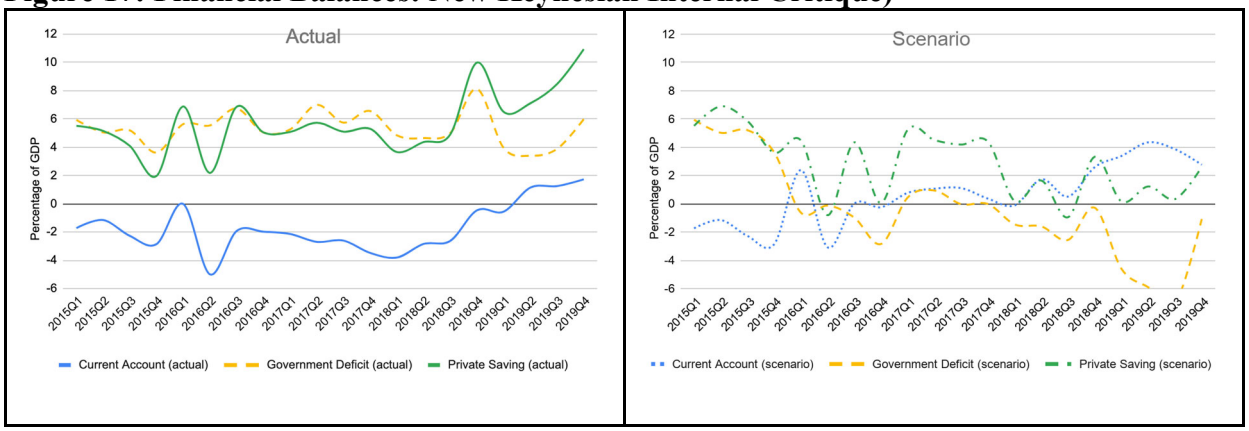
Figure 16: New Keynesian Internal Critique



The policy package implemented in this scenario entails a direct relationship between the financial balances of the private sector and the government. As a result of the restrictive fiscal policy that this program entails, the government deficit is significantly reduced, eventually reaching equilibrium and even becoming positive. Since the improvement in the government's financial balance is mostly driven by the reduction in the transfers to the private sector (either through wages or direct transfers such as subsidies on utilities or social security benefits), the savings of the latter are reduced, though keeping (roughly) positive along almost all the sample.

An endogenous byproduct of this program is the improvement in the current account, which is a direct consequence of the drop in imports that the recession entails.[45] The improvement in the government's financial balance reduces its stock of domestic debt, which is in line with the reduction in the private sector's saving in comparison to the baseline. The private sector also reduces its stock of bills (the devaluations discourage investment in this type of asset) and reallocates the composition of its portfolio in favor of foreign assets. It should be borne in mind that the private sector increasing its stock of foreign assets does not imply that it is net saving—it only means that the rest of the world's "budget constraint" is being fulfilled.[46] What ensures the private sector's flow-to-stock consistency is both the reduction in its holdings of domestic debt and money, this latter being the buffer variable.

Figure 17: Financial Balances: New Keynesian Internal Critique)

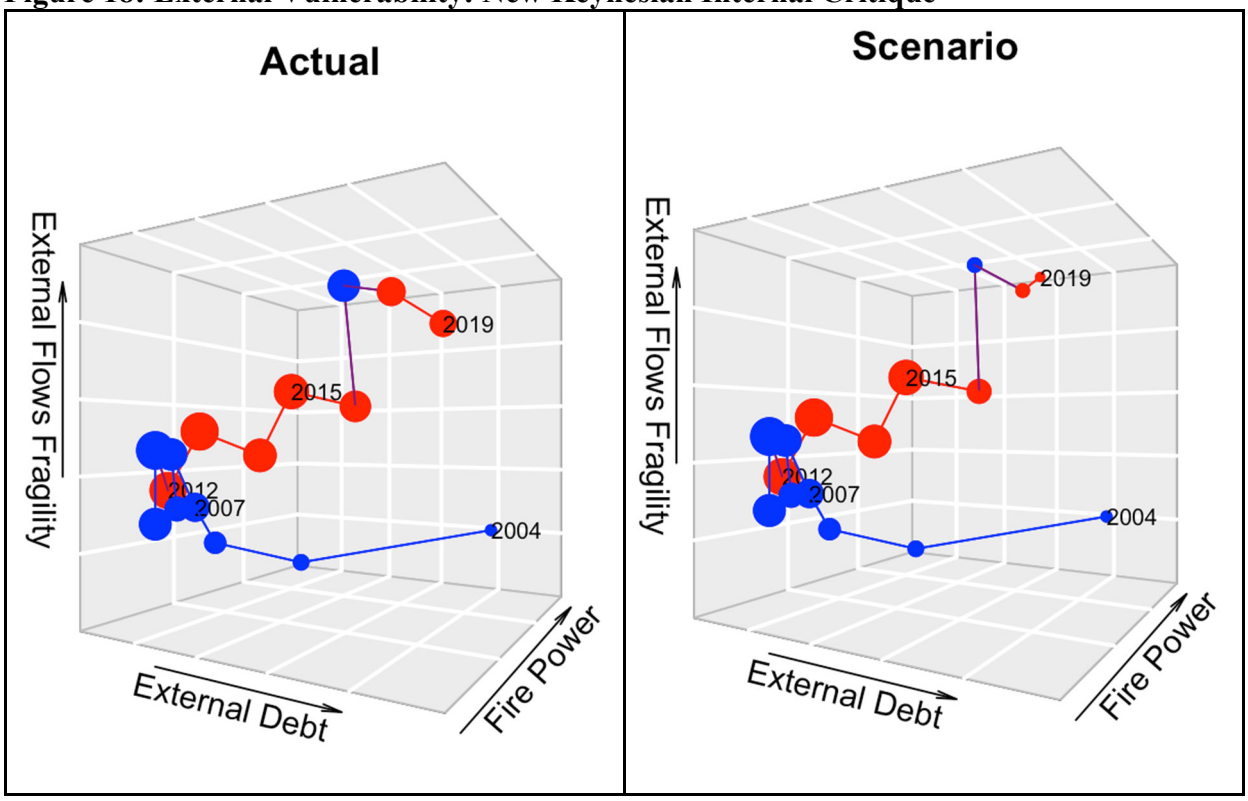


In terms of external vulnerability, from figure 18 it is possible to conclude that while the full-fledged New Keynesian program would have not provided a safer scenario it would have been worse for the economy in terms of growth. Since the foreign indebtedness is assumed to be exogenous and kept unchanged in comparison to the baseline, the position of the economy on the corresponding axis is the same in both cases. A similar picture is observed for the case of the firepower index, that does not vary significantly, as the stock of foreign reserves is kept constant, while the sale of bills by the private sector is compensated for by an increase in the stock of money. The external flows' fragility shows a very similar performance, although its

[45] Exports are lower compared to the baseline, as none of the exogenous variables that determine them are being shocked, and the real exchange rate appreciates as a result of the simulated program.
[46] Since the current account is improving and the fact that both foreign reserves and the private and public external liabilities are unchanged, it must be the case that the stock of foreign assets held by the private sector is increasing.

composition varies significantly relative to the baseline in the scenario, as there is a reduction in the acquisition of foreign assets (mainly in the first half of the sample) that is compensated for by the drop in exports that the real appreciation brings about. The decrease in imports contributes to softening the demand for foreign exchange but it is insufficient to provide higher sustainability to the balance of payments.

Figure 18: External Vulnerability: New Keynesian Internal Critique



Overall, in the case where a New Keynesian program without fiscal dominance had been implemented it seems that the economy's external vulnerability would have been as high as it actually was, probably leading to the same events that ended up triggering the balance of payments crisis of 2018. But the effects on the real economy would have probably been worse, as the size of the dots in the right-hand panel of figure 18 show. The question of whether a full-fledged New Keynesian program would have given markets more credibility in the Argentinean economy is still an open question. But if that had been the case, the result would have been a further increase in foreign indebtedness, which would have made the economy increase its external vulnerability (in terms of figure 18, a movement up and rightwards) eventually ending up in a crisis.

Question 4: The Heterodox Critique

One of the main critiques of the program actually implemented in the period 2016–19 focuses on its underlying inflation theory. According to the government, inflation was mainly a problem of lack of credibility combined with an excessive monetary expansion. As long as tight monetary and fiscal policies were implemented, inflation would quickly go down to one-digit levels. According to the official viewpoint, restoring credibility not only implied the removal of certain regulations (like capital controls) but also reducing the budget deficit, the major part of which was created by the subsidies on utilities. On the contrary, from a heterodox perspective all these regulations had a specific goal: to prevent inflation from accelerating. Thus, simulating the effects of an alternative program that would have accounted for the fact that price dynamics are driven by supply-side factors implies the following assumptions:

- Capital controls are loosened, but not completely removed ($controls^{S4} = 0.5$).
- The central bank intervenes in the foreign exchange market to avoid large depreciations
- The interest rate is increased less than in the baseline ($r^{S4} = 0.9r^{actual}$)
- Subsidies on utilities are reduced to a lesser extent ($s^{S4} = 0.6$)

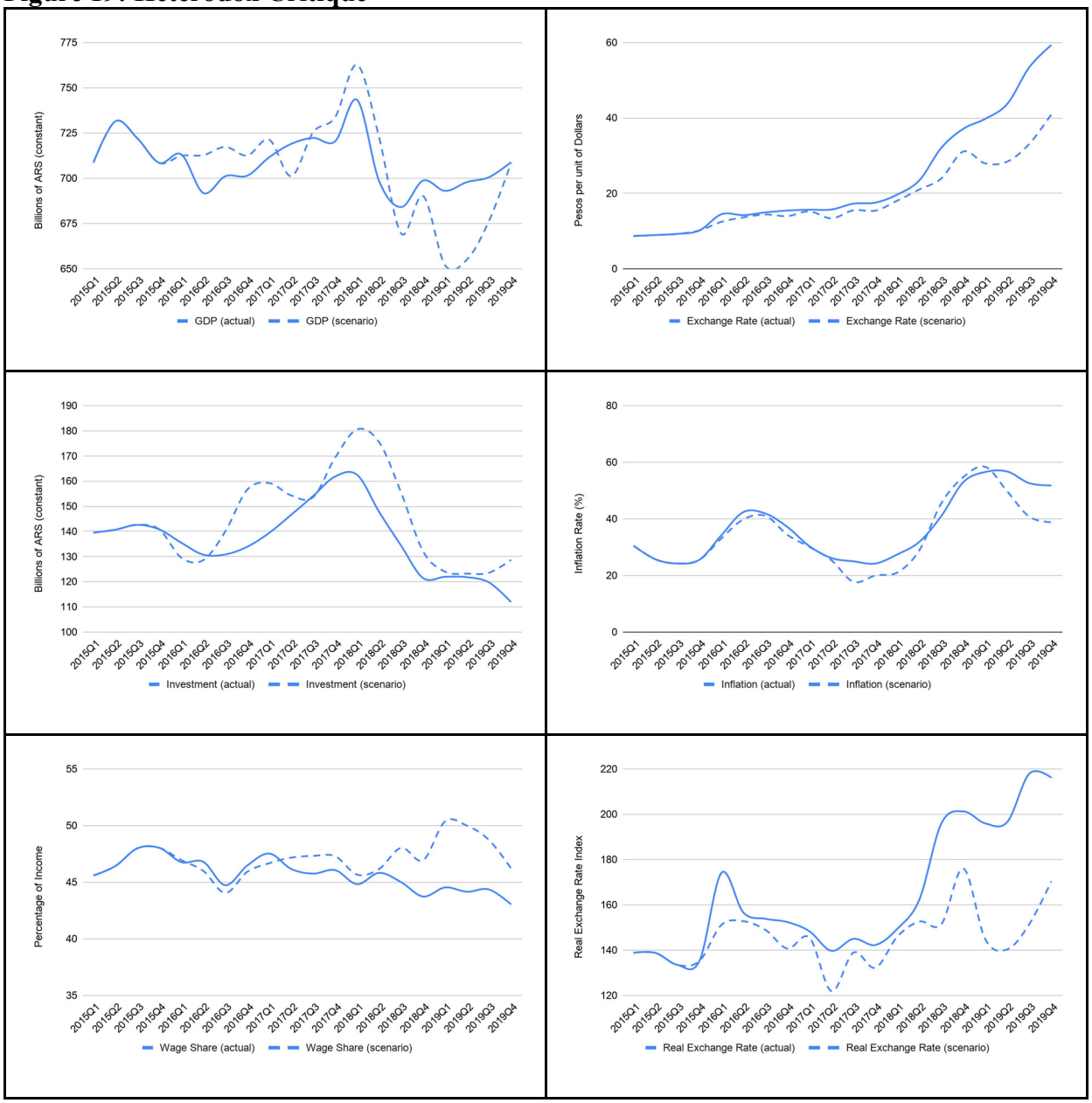
In order to analyze the results of the simulations it should be recalled that until 2015Q4 there were capital controls that put high constraints on the acquisition of foreign assets by the private sector. While in the baseline these controls are completely removed from 2016Q1 onwards, the scenario assumes that controls are softened but not entirely removed. Even if the reduction in capital controls increases the demand for foreign assets, thereby exerting upward pressure on the exchange rate, this is compensated for by a higher foreign exchange outflow coming from imports (which results from the higher level of activity, as is observed in the top-left panel of figure 19).[47] As a consequence, the trajectory of the nominal exchange rate is similar to the baseline, also bringing about a similar behavior from inflation. The reason why the inflation rate is slightly lower than in the baseline is the softer reduction of the subsidies on utilities. The lower inflation implies that the private sector's real disposable income is higher, thereby increasing consumption and investment (recall that investment depends on variables that are

[47] If the government wanted to prevent the exchange rate depreciation derived from the increase in imports, import tariffs and quotas could be established. The inclusion of these policy tools is left for a future version of the model.

directly related to economic activity, such as capacity utilization and the rate of profit). Overall, output exhibits more growth along all the simulation, although the endogenous devaluations that take place from time to time (in this case, from 2018Q2 onwards) eventually take it to a level that is roughly identical to the one observed in the beginning of the simulation.

As in the previous scenarios inflation shows an oscillatory dynamic, the accelerations being explained by endogenous devaluations and the eventual supply-side shocks, and the decelerations happening when the nominal exchange rate temporarily stabilizes and wage pressures recede when employment levels decrease. Income distribution, for its part, tends to improve as the real wage increases, while labor productivity oscillates around the level observed in the baseline. Thus, the combination of policies entailed in this scenario yields a similar growth level to that found in the baseline but a more equitable income distribution, which is partly translated into a more appreciated real exchange rate. The problem of this outcome will be observed more clearly when analyzing the external sector.

Figure 19: Heterodox Critique



Even if the alternative program examined in the simulation produces better performance in terms of production and demand, it does not seem sustainable from the perspective of the financial balances of the aggregate sectors. Figure 20 shows that the policies implemented in this scenario tend to deepen the disequilibria that were present until 2015, i.e., a current account deficit that, given the positive saving of the private sector, implied a large deficit for the government. Since the economic policies simulated in this scenario tend to reduce fiscal convergence (the subsidies on utilities are reduced at a slower pace than in the baseline), the

government deficit is larger. The higher level of activity combined with a more appreciated real exchange rate increases the current account deficit. Private saving stays at a positive level and increases slightly as a result of the increase in disposable income that results from the higher current transfers from the government (which take the form of subsidies on utilities). The external disequilibrium that the current account deficit implies is eventually cleared when a devaluation takes place (for instance, in the process that begins in 2018Q3). These sequences of current account deficits followed by devaluations, which were also present before the sample period of this simulation, illustrate this macroeconomic policy combination's lack of sustainability.

Figure 20: Financial Balances: Heterodox Critique

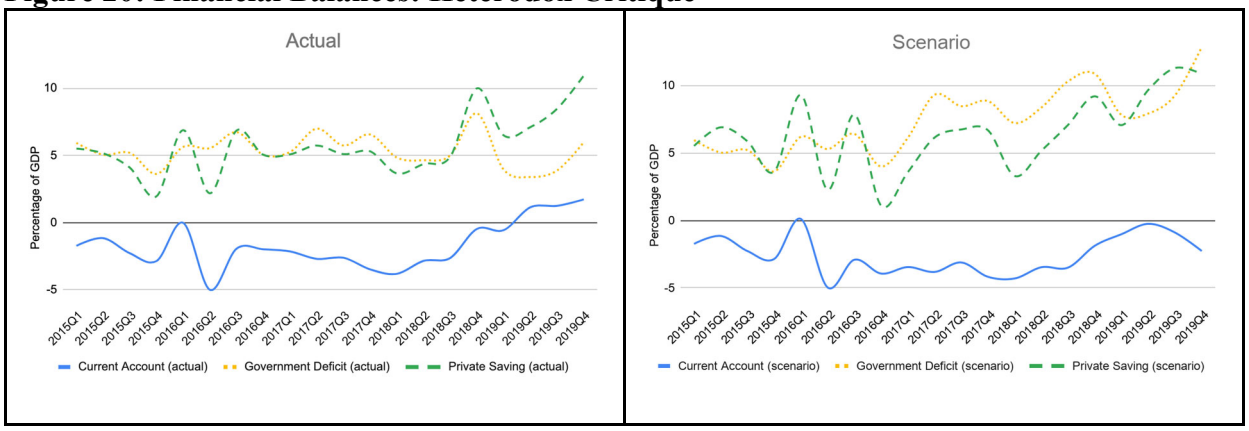
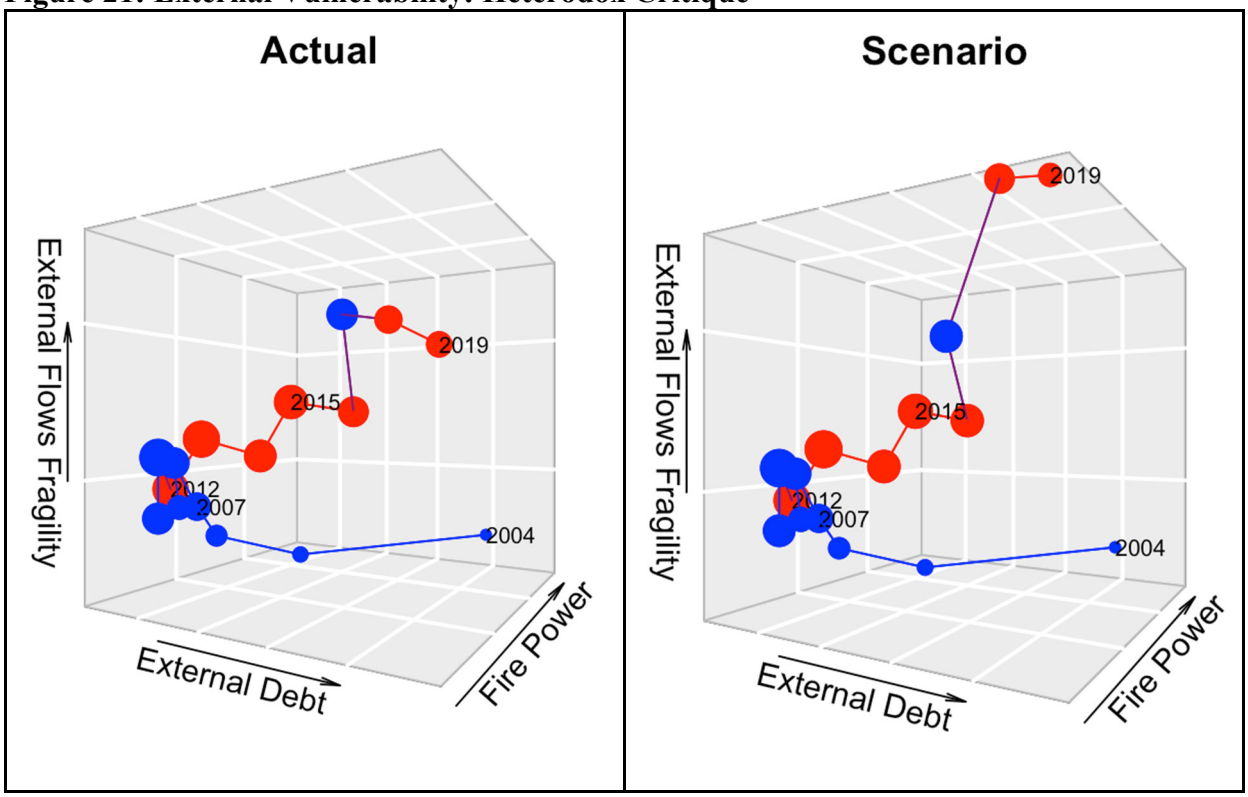


Figure 21 shows that the heterodox program as proposed in this simulation would not have produced a better performance in terms of external vulnerability. As in the previous scenario, the economy's position on the external debt axis is almost the same because there are no changes in the assumptions regarding this exogenous variable (the difference is given by the change in the denominator, GDP, which is larger in the scenario). In terms of the external flows sustainability index, the scenario exhibits worse performance, mostly explained by the lower current account balance, which more than compensates for the reduction in the acquisition of foreign assets by the private sector. In other words, the leak of foreign exchange that is prevented as a result of the establishment of capital controls (of intermediate intensity, as is the case of this scenario) seems to be self-defeating—preventing the exchange rate from depreciating as a result of the acquisition of foreign assets eventually results in a current account deficit, thereby putting pressure on the exchange rate. In order to dig deeper into the alternatives

at the government's disposal, the model should be extended to include trade policy tools (such as imports quotas or tariffs) that can prevent the current account from worsening in a context where capital controls keep the exchange rate at levels that maintain private consumption at high levels.

Figure 21: External Vulnerability: Heterodox Critique



In conclusion, this last policy program, where inflation is tackled through a series of policy tools that account for its supply-side determinants, seems to produce better performance in terms of economic growth and income distribution. However, the question on the external sustainability of this alternative is still open. Further developments in the model developed in this paper could provide deeper insights into the possibility of attaining a stable and sustainable configuration of economic policies that take the Argentinean economy out of its long stagflation.

7. CONCLUSIONS

The word that best describes the economic dynamics of Argentina in the 2010s is stagflation. By the end of 2019, GDP was lower than it was ten years before, while the rate of inflation had more than doubled. Underneath this poor performance was a persistent balance of payments crisis, which came to the surface through the current account or the financial account, depending on what the French Regulation School calls the "mode of regulation." Eventually, these tensions ended up triggering an exchange rate devaluation, thereby accelerating inflation and hampering the economy's growth prospects.

During this decade of stagflation, two governments with antagonistic political orientations were in power. Until 2015 there was a center-left administration that attempted to implement a set of policies associated with what is known as a wage-led growth regime. In December 2015, a center-right government took office and quickly implemented a set of market-friendly policies supposedly oriented to boosting growth through the increase in exports and (foreign) investment. Although the center-left government was able to keep GDP at a high level and managed to minimize crisis episodes, the path the economy was following did not seem to be sustainable, as the current account was persistently negative, the budget deficit was high, the inflation rate was well-above international standards, and there were a series of parallel (some of them illegal) exchange rate markets. On the other hand, the experience of the center-right government of the period 2016–19 ended in failure, even in the words of their most loyal advocates. In three of the four years of its administration, GDP dropped and the anti-inflation policies that were implemented ended up producing the results that were opposite of what the policymakers were expecting. The increase of foreign indebtedness beyond the financing needs of the economy, combined with the full liberalization of the financial account, brought about a crisis that coexisted with almost the whole second half of the administration.

During each of these administrations there were critiques from the other side, which claimed that the path that was being taken was not sustainable and would eventually end up in a crisis. With the advantage of hindsight this paper addresses some of these critiques to examine to what extent the economic performance would have been better had the policy recommendations in those critiques been implemented. The analysis is made through an empirical SFC model in

order to ensure the coherence of the results and to give the outcomes of the simulations a holistic and dynamically consistent interpretation. Since to the author's knowledge this model is the first of its kind for Argentina, most of the paper consists of the description of the model. The model was used to address four questions, two of them regarding the 2012–15 period and the other two focused on the 2016–19 interval. In the four cases the questions attempt to propose alternative policy combinations to the ones that were actually implemented.

The alternatives to the wage-led model implemented in 2012–15 consist of a pure mainstream program, which was denoted as the New Keynesian alternative, and a hybrid proposal more in line with what is currently known as New Developmentalism. Compared to the baseline (the program that was actually implemented) both cases imply the establishment of more market-friendly policies, although to a different extent (for instance, in the New Keynesian program the fiscal and monetary tightening is stronger). Only in the New Developmentalist case is it possible to conclude that the policy combination entailed in the macroeconomic program would have yielded better growth performance without jeopardizing the economy's external sustainability. However, the byproduct of this better performance is a deterioration of income distribution. The New Keynesian program, for its part, has negative effects on GDP as a direct consequence of the fiscal adjustment and its effects on aggregate demand (through the channel of cost-push inflation and its impact on real private consumption). Although the current account exhibits better performance than in the baseline, this does not prevent the economy from the tensions in the balance of payments, as the liberalization of capital flows combined with the higher inflation rates end up increasing the acquisition of foreign assets. The increase in exports that a higher real exchange rate would yield does not seem to be strong enough to counter the contractionary effects of the devaluation, at least in the short and medium term and given the structure of the economy (as reflected in the parameters of the model) and the external conditions (as reflected in the exogenous variables beyond the control of the government).

One of the alternatives to the New Keynesian approach implemented in 2016–19 is based on an internal critique, which states that the reason why the program failed is that it was fiscally dominated. Thus, in the third simulation a *tout court* New Keynesian program was tested. The results in terms of growth proved to be even poorer than the ones observed in the baseline, as the effect on inflation ends up being even worse. In terms of external vulnerability, the results of

this purer alternative do not seem to be better, as the better performance of the current account seems to be outweighed by the increase in the acquisition of foreign assets by the private sector. The last simulation, which was denoted as the heterodox critique, attempts to simulate the hypothetical effects of an anti-inflation program more focused on the supply-side determinants of inflation. In practice, this would have implied a softer fiscal tightening (because the reduction in the subsidies on utilities would have been lower) and a more intermediate flexibilization of capital controls. The results of the simulations show that such a program would have produced better results in terms of economic growth and inflation, but at the cost of keeping the disequilibria in the financial balances of the aggregate sectors at roughly the same levels observed in the period 2012–15, which did not seem sustainable.

From the results of these first simulations that were made with the model presented in this paper a final hypothesis is made: that the problem that is keeping Argentina in stagflation goes beyond the domain of macroeconomics. The fact that in practice two antagonistic macroeconomic programs were implemented, neither of them being able to produce a good and sustainable macroeconomic performance, is a first symptom that favors the case for that hypothesis. When the model is used to counterfactually test the policy recommendations of these approaches with the external conditions that prevailed while the opposite program was implemented, none of them yield results that can be deemed sustainable. However, this need not imply that macroeconomic policy has nothing to contribute to a process of sustainable growth or that a coherent macroeconomic program is not a necessary condition for a process of structural change that tackles the deepest causes of the recurrent crises that affect the Argentinean economy. The model developed in this paper can be useful for studying the different policy combinations that, given a specific context, can bring about more stable and sustainable dynamics. If these were virtuously combined with the other dimensions of economic policy, it might be possible that there are fewer lost decades in Argentina’s future.

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APPENDIX

Estimation of Behavioral Equations

All the behavioral equations, except for the portfolio equations, were estimated through standard error correction models. In all cases the following procedure was applied. First, augmented Dickey-Fuller unit root tests were made to verify the order of integration of the relevant variables. Once it was checked that the variables had the same order of integration, the Johansen cointegration test was applied. For the cases where cointegration relations were found, two models were estimated: one for the long term (where the variables were written in natural logarithms) and one for the short term (where the variables enter in their logarithmic differences of order one). After the estimations, the normality and homoscedasticity of the residuals were checked. In the case of portfolio equations, the estimations showed better results when using nonlinear autoregressive distributed lags models (NARDL), as proposed by Shin, Yu, and Greenwood-Nimmo (2014). In these cases, after running the estimations, asymmetric cointegration tests and asymmetry tests were done through the Wald test. An alternative version of the model was estimated through three stage least squares to account for potential simultaneity in some of the endogenous variables of the model. The use of this method did not significantly improve the results of the estimations.

Table A1: Results of the Estimations of the Behavioral Equations

Private formal employment

L^F	Long run coefficients	
y	0.34***	Method: OLS
		Sample: 2007Q1-2019Q4
		Adj-R2: 0.981
	Short run coefficients	
y	0.09***	Method: OLS
L^F_{t-1}	0.76***	Sample: 2007Q2-2019Q4
w^P/p^C	-0.04***	Adj-R2: 0.818
EC^{LF}	-0.23***	

Private informal employment

L^I/L^F_{t-1}	Long run coefficients	
y	-0.20*	Method: OLS
		Sample: 2007Q1-2019Q4
		Adj-R2: 0.918
	Short run coefficients	
y	-0.29**	Method: OLS
L^I_{t-1}/L^F_{t-2}	0.18	Sample: 2007Q2-2019Q4
EC^{LI}	-0.74***	Adj-R2: 0.404

Private Consumption

c	Long run coefficients	
yd^1	0.25***	Method: OLS
yd^2	0.41***	Sample: 2007Q1-2019Q4
f	0.23***	Adj-R2: 0.971
	Short run coefficients	
yd^1	0.35***	Method: OLS
yd^2	0.04	Sample: 2007Q2-2019Q4
f	0.17***	Adj-R2: 0.812
r	-0.08***	
EC^C	-0.32***	

Imports

M^{USD}	Long run coefficients	
y	2.35***	Method: OLS
e	-0.63***	Sample: 2004Q4-2019Q4
		Adj-R2: 0.974
	Short run coefficients	
y	1.47***	Method: OLS
e	-0.59***	Sample: 2007Q1-2019Q4
EC^M	-1.17***	Adj-R2: 0.473

Exports

X^{USD}	Long run coefficients	
p^*	0.59***	Method: OLS
y^{prim}	0.37***	Sample: 2006Q4-2019Q4
$controls$	-0.09***	Adj-R2: 0.886
	Short run coefficients	
p^*	0.21***	Method: OLS
y^{prim}	-0.03	Sample: 2007Q2-2019Q4
y^{BR}	3.30***	Adj-R2: 0.744
e	0.30***	
EC^M	-0.36**	

Private Wage

w^P	Long run coefficients	
L^F	0.95***	Method: OLS
p^C	0.38***	Sample: 2007Q1-2019Q4
		Adj-R2: 0.999
	Short run coefficients	
L^F	0.99***	Method: OLS
p^C	0.37***	Sample: 2007Q2-2019Q4
EC^W	-0.22***	Adj-R2: 0.360

Demand for electricity

d^{ELEC}	Long run coefficients	
c	0.47***	Method: OLS
		Sample: 2007Q1-2019Q4
		Adj-R2: 0.897
	Short run coefficients	
c	0.14***	Method: OLS
EC^{ELEC}	-0.12***	Sample: 2007Q2-2019Q4
		Adj-R2: 0.754

Private Investment

i^P/k_{t-1}	Long run coefficients	
F_{t-1}/k_{t-1}	0.48***	Method: OLS
u_{t-1}	0.38	Sample: 2007Q1-2019Q4
$controls$	-0.04**	Adj-R2: 0.892
E_{t-1}	-0.47***	
r_{t-1}	-0.21***	
p^*	0.20***	
	Short run coefficients	
F_{t-1}/k_{t-1}	0.29***	Method: OLS
u_{t-1}	0.31	Sample: 2007Q3-2019Q4
$controls$	0.01	Adj-R2: 0.767
E_{t-1}	-0.22***	
r_{t-1}	-0.09**	
p^*	0.14***	
i^P_{t-1}/k_{t-2}	0.46***	
EC^I	-0.66***	

Demand for other utilities

D^O	Long run coefficients	
Y	2.74***	Method: OLS
D^{ELEC}	-0.69***	Sample: 2007Q1-2019Q4
		Adj-R2: 0.972
	Short run coefficients	
Y	1.73**	Method: OLS
D^{ELEC}	-0.94***	Sample: 2007Q2-2019Q4
EC^O	-0.68***	Adj-R2: 0.776

Private Consumption Price Deflator

p^C	Long run coefficients	
w^P	0.61***	Method: OLS
E	0.30***	Sample: 2007Q2-2019Q4
p^R	0.08***	Adj-R2: 0.999
	Short run coefficients	
p^C_{t-1}	0.28**	Method: OLS
w^P	0.43***	Sample: 2007Q3-2019Q4
E	0.15***	Adj-R2: 0.704
p^R	0.10**	
u_{t-1}	0.34**	
EC^{PC}	-0.70***	

Public Consumption Price Deflator

p^G	Long run coefficients	
w^G	1.13***	Method: OLS
$L^G?$	-1.93***	Sample: 2007Q1-2019Q4
		Adj-R2: 0.999
	Short run coefficients	
w^G	0.91***	Method: OLS
$L^G?$	-1.20***	Sample: 2007Q2-2019Q4
GC	0.09***	Adj-R2: 0.708
EC^{PG}	-0.34**	

Private Investment Price Deflator

p^K	Long run coefficients	
w^P	0.42***	Method: OLS
E	0.49***	Sample: 2007Q1-2019Q4
r	0.05*	Adj-R2: 0.999
	Short run coefficients	
w^P	0.45***	Method: OLS
E	0.33***	Sample: 2007Q2-2019Q4
r	0.06***	Adj-R2: 0.827
p^R	0.11**	
EC^{PK}	-0.31***	

Exports Price Deflator

p^X	Long run coefficients	
p^*	0.37***	Method: OLS
E ?	0.68***	Sample: 2007Q1-2019Q4
p^C	0.33***	Adj-R2: 0.993
	Short run coefficients	
p^*	0.26***	Method: OLS
E ?	0.75***	Sample: 2007Q2-2019Q4
p^C	0.36*	Adj-R2: 0.841
EC^{PX}	-0.13*	

Imports Price Deflator

p^M	Long run coefficients	
E ?	0.85***	Method: OLS
p^{USA}	1.71***	Sample: 2006Q4-2019Q4
		Adj-R2: 0.998
	Short run coefficients	
E ?	0.86***	Method: OLS
p^{USA}	1.93***	Sample: 2007Q1-2019Q4
EC^{PM}	-0.36*	Adj-R2: 0.858

Demand for foreign assets

$\Delta ln(FA^P/W^P_{t-1})$	Coefficients	
$ln(ED^{G+}_{t-1})$	0.43***	Method: NARDL
$ln(ED^{G-}_{t-1})$	-0.05	Sample: 2009Q3-2019Q4
$controls_{t-1}$	-0.03	Adj-R2: 0.763
$ln(p^C_{t-1})$	-0.28***	
$\Delta ln(FA^P_{t-1}/W^P_{t-2})$	-0.69***	
$\Delta ln(p^C_t)$	3.30***	
$\Delta ln(ED^{G-}_t)$	-0.34***	
$\Delta ln(ED^{G+}_t)$	0.60***	

Demand for bonds

$\Delta ln(DD/W^P_{t-1})$	Coefficients	
$ln(r^{G+}_{t-1})$	1.58***	Method: NARDL
$ln(r^{G-}_{t-1})$	-1.44***	Sample: 2009Q3-2019Q4
$controls_{t-1}$	0.08	Adj-R2: 0.664
$ln(p^C_{t-1})$	0.27***	
$\Delta ln(DD_{t-1}/W^P_{t-2})$	0.35***	
$\Delta ln(p^C_t)$	-6.36***	
$\Delta ln(r^{G-}_t)$	-0.45***	
$\Delta ln(vol^E_t)$	-0.29***	

Demand for bills

$\Delta ln(B/W^P_{t-1})$	Coefficients	
$ln(r^+_{t-1})$	1.08***	Method: NARDL
$ln(r^-_{t-1})$	0.01	Sample: 2009Q3-2019Q4
$controls_{t-1}$	0.31***	Adj-R2: 0.599
$ln(p^C_{t-1})$	-0.75***	
$\Delta ln(p^C_t)$	3.23***	
$\Delta ln(r^+_t)$	-0.57***	

Table A2: Model Variables

Variable	Symbol	Type
Real GDP	y	Endogenous - identity
Real private consumption	c	Endogenous - stochastic
Real investment	i	Endogenous - identity
Real government consumption	g	Endogenous - identity
Real exports (in ARS)	x	Endogenous - identity
Real imports (in ARS)	im	Endogenous - identity
Real private investment	i^P	Endogenous - stochastic
Real public investment	i^G	Exogenous - policy variable
Nominal government consumption	G	Endogenous - identity
Public wage bill	WB^G	Endogenous - identity
Public operating expenditures	GC	Exogenous - policy variable
Public nominal wage	w^G	Exogenous - policy variable
Public employment	L^G	Exogenous - policy variable
Public consumption price deflator	p^G	Endogenous - stochastic
Nominal private consumption	C	Endogenous - identity
Private consumption price deflator	p^C	Endogenous - stochastic
Nominal investment	I	Endogenous - identity
Nominal exports	X	Endogenous - identity
Exports price deflator	p^X	Endogenous - stochastic
Nominal imports	IM	Endogenous - identity
Imports price deflator	p^{IM}	Endogenous - stochastic
Nominal GDP	Y	Endogenous - identity
Private wage bill	WB^P	Endogenous - identity
Private nominal wage	w^P	Endogenous - stochastic
Formal Private employment	L^F	Endogenous - stochastic
Informal Private employment	L^I	Endogenous - stochastic
Mixed income	MI	Endogenous - identity
Self-employment compensation	w^S	Exogenous
Self-employment	L^S	Exogenous
Net taxes on production	NT	Endogenous - identity
Real demand for electricity	d^{ELEC}	Endogenous - stochastic
Nominal demand for electricity	D^{ELEC}	Endogenous - identity
Subsidies to the production of electricity	NT^{ELEC}	Endogenous - identity
Subsidies to the production of other utilities	NT^O	Endogenous - identity

Nominal demand for other utilities	D^O	Endogenous - stochastic
Average monomic cost	AMC	Exogenous
Subsidy rate	s	Exogenous - policy variable
Price of utilities	P^R	Endogenous - identity
Value added tax	VAT	Endogenous - identity
Value added tax rate	τ^{VAT}	Exogenous - policy variable
Profits (Gross operating surplus)	F	Endogenous - identity
Social security benefits	SS	Endogenous - identity
Allowance (cash transfer)	AL	Exogenous - policy variable
Beneficiaries of cash transfers	$Beneficiaries$	Exogenous - policy variable
Transfers of provinces to households	CT^H	Exogenous - policy variable
Taxes paid by households	T^H	Endogenous - identity
Income tax paid by households	IT^H	Endogenous - identity
Income tax rate (households)	τ^H	Exogenous - policy variable
Contribution of households to social security	$CONT^H$	Endogenous - identity
Household's contribution rate	$\tau^{SS,H}$	Exogenous - policy variable
Local taxes paid by households	TP^H	Exogenous - policy variable
Taxes paid by firms	T^F	Endogenous - identity
Income tax paid by firms	IT^F	Endogenous - identity
Income tax rate (firms)	τ^F	Exogenous - policy variable
Export duty rate	τ^X	Exogenous - policy variable
Firms' contribution rate	$\tau^{SS,F}$	Exogenous - policy variable
Real disposable Income (formal workers)	yd^1	Endogenous - identity
Real disposable Income (informal workers and pensioners)	yd^2	Endogenous - identity
Real profits	f	Endogenous - identity
Short term interest rate (nominal)	r	Exogenous - policy variable
Short term interest rate (real)	rr	Endogenous - identity
Real stock of capital	k	Endogenous - identity
Rate of capacity utilization	u	Endogenous - identity
Exchange rate volatility	vol^E	Endogenous - identity
Nominal exchange rate	E	Endogenous - identity
Real exchange rate	e	Endogenous - identity
International price of commodities	p^*	Exogenous
Private saving	S^P	Endogenous - identity
Other public expenditures	OE	Exogenous
Stock of central bank bills	B	Endogenous - stochastic

Stock of government bonds	DD	Endogenous - stochastic
Interest rate on private external debt	r^{P*}	Exogenous
Private external debt	ED^P	Exogenous
Auxiliary flow variable (private sector)	AF^P	Exogenous
Capital depreciation rate	δ	Exogenous
Nominal stock of capital	K	Endogenous - identity
Capital-output ratio	v	Exogenous
Private sector wealth	W^P	Endogenous - identity
Foreign assets held by the private sector (in ARS)	FA^P	Endogenous - stochastic
Foreign assets held by the private sector (in USD)	$FA^{P,USD}$	Endogenous - identity
Stock of money held by the private sector	H	Endogenous - identity
Auxiliary stock variable (private sector)	AS^P	Endogenous - identity
Auxiliary stock variable (government)	AS^G	Exogenous
Auxiliary stock variable (central bank)	AS^{CB}	Exogenous
Auxiliary stock variable (rest of the world)	AS^{RW}	Exogenous
Nominal public investment	I^G	Endogenous - identity
Investment price deflator	p^K	Endogenous - stochastic
Interest rate on government domestic debt	r^G	Exogenous - policy variable
Interest rate on public external debt	r^{G*}	Exogenous - policy variable
Budget balance of the government	S^G	Endogenous - identity
Public external debt	ED^G	Exogenous
Advances of the central bank to the government	A	Exogenous
Government deposits at the central bank	DD^{USD}	Exogenous
Nominal exports (in USD)	X^{USD}	Endogenous - stochastic
Nominal imports (in USD)	IM^{USD}	Endogenous - stochastic
Real output of the primary sector	y^{prim}	Exogenous
Real GDP of Brazil	y^{BR}	Exogenous
Consumer price index of the US	P^{USA}	Exogenous
Saving of the rest of the world	S^{RW}	Endogenous - identity
Auxiliary flow variable (rest of the world)	AF^{RW}	Exogenous
Current account (in USD)	CA	Endogenous - identity
Foreign assets issued by the rest of the world	FA	Endogenous - identity
Foreign assets held by the central bank	FA^{CB}	Exogenous - policy variable
Saving of the central bank	S^{CB}	Endogenous - identity