

# Covid-19 and Cost of Living in Developing Countries

**Josue Diwambuena**

Free University of Bozen-Bolzano

**Ishara Musimwa**

Universite Catholique de Bukavu

**Jean-Paul K. Tsasa** (✉ [tsasa.jean-paul@courrier.uqam.ca](mailto:tsasa.jean-paul@courrier.uqam.ca))

Univeriste du Québec <https://orcid.org/0000-0001-8385-3831>

---

## Research Article

**Keywords:** Covid-19, Cost of Living, CPI, DRC

**Posted Date:** October 30th, 2020

**DOI:** <https://doi.org/10.21203/rs.3.rs-100217/v1>

**License:**  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

# Covid-19 and Cost of Living in Developing Countries\*

Josue Diwambuena<sup>†</sup>    Ishara Musimwa<sup>‡</sup>    Jean-Paul K. Tsasa<sup>§</sup>

October 29, 2020

## Abstract

We document some evidence about effects of the Covid-19 pandemic on the cost of living in developing countries. We use data from the National Statistical Office of the Democratic Republic of Congo (DRC). Data are in weekly frequency. We propose a simple two-step strategy to evaluate the Covid-19 effect on the cost of living in the DRC. We consider two types of households: a typical household for the DRC and a typical household for Kinshasa —Kinshasa is the national capital and the largest city of the DRC. Then we compute the *quasi-causal effect* and the *volatility differential* for each household type. We show: First, in absolute terms, the consumption basket for a typical household in Kinshasa exhibits both a higher quasi-causal effect and a higher volatility differential than those observed from the consumption basket of a typical household for the whole country (i.e. the DRC). Second, in relative terms, the consumption basket for a typical household in Kinshasa exhibits higher quasi-causal effects than that for a typical household only in prices of food and non-alcoholic beverages and in prices of transport. Finally and more importantly, unlike developed countries where consumers spent more on food and other groceries during the pandemic, our results suggest that in response to the Covid-19 crisis, both the typical household in DRC and the typical household in Kinshasa spent more on health and communication. These findings highlight deep structural differences between developed countries, where health insurance is functional, and developing countries where patients generally face a deficit or lack of viable health insurance. Moreover, we argue expenditures on communication increased in response mainly to the lockdown measures, mobility restrictions or closing of national borders.

*Keywords:* Covid-19, Cost of Living, CPI, DRC.

*JEL Codes:* C43, E21, E31.

---

\*Preliminary version. Comments are welcome. The authors declare that they have no conflicts of interest.

<sup>†</sup>Faculty of Economics and Management, Free University of Bozen-Bolzano, [jdiwambuena@unibz.it](mailto:jdiwambuena@unibz.it).

<sup>‡</sup>Faculty of Economics and Management, Université Catholique de Bukavu, [ishara.musimwa@ucbukavu.ac.cd](mailto:ishara.musimwa@ucbukavu.ac.cd).

<sup>§</sup>Department of Economics, Univeristé du Québec à Montreal, [tsasa.jean-paul@courrier.uqam.ca](mailto:tsasa.jean-paul@courrier.uqam.ca).

# 1 Introduction

Several policy measures, including rules on social distancing, mobility restrictions, lockdown or even border closures, have been taken by governments in many countries in order to curb the spread of Covid-19. These measures have drastically changed consumer spending patterns. Recent works in the literature present empirical evidence about these changes.<sup>1</sup> These studies suggest that, during the crisis, consumers have spent more on food and other groceries and less on transportation, hotels, restaurants or entertainment. Most of these studies mainly identify these patterns in developed countries and less evidence is shown for developing countries. While some of these patterns can be observed in both developed and developing countries, it is however not clear whether the effects of Covid-19 pandemic on consumer spending is the same across countries.

We argue that effects of Covid-19 on consumer spending in developing countries can be fundamentally different from those observed in developed countries for a variety of reasons. First, developed and developing countries do not have the same type of economic institutions.<sup>2</sup> Second, the economic structures in developed and developing countries are not identical. For example, developing countries are characterized by a large share of the informal sector. Moreover, private savings are often either extremely low or non-existent.<sup>3</sup> Third, the content of the basket of goods and services used to assess price changes associated with the cost of living is not identical across countries.<sup>4</sup>

In this paper, we contribute to the economic literature on the effects of the Covid-19 pandemic on the cost of living (see section 2 for a brief literature). We document new evidence about the effects of the Covid-19 pandemic on the cost of living for an average consumer in developing countries. We consider the case of the Democratic Republic of Congo (DRC), one of the least developed countries in the world (LDCs).<sup>5</sup> More specifically, we seek to examine how the Covid-19 pandemic affects prices that the average consumer pay for different components of the basket of goods and services.<sup>6</sup> We consider two types of households: a typical household for the DRC and a

---

<sup>1</sup>Baker et al. (2020b), Cavallo (2020), Coibion et al. (2020) are among these papers. We provide an in-depth discussion in the section on related literature.

<sup>2</sup>For instance, using quasi-natural experiments in history, Acemoglu et al. (2005) show differences in economic institutions are the fundamental cause of differences in economic development.

<sup>3</sup>See Buehn and Schneider (2012), La Porta and Shleifer (2014), and Maloney (2004) for more details.

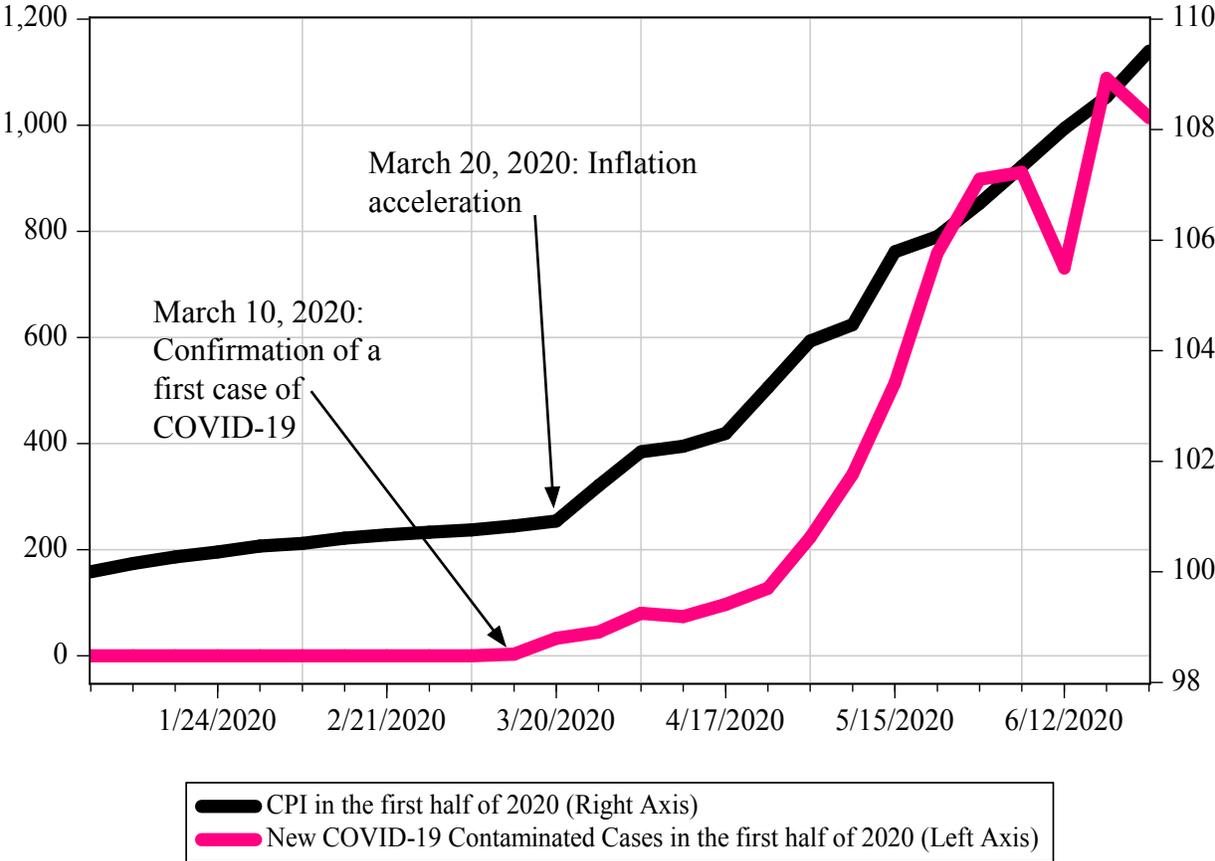
<sup>4</sup>There is a large body of literature on cross-country comparisons of prices and real income undertaken under the auspices of the International Comparison Program (ICP). See Annex 4 in ILO (2004).

<sup>5</sup>LDCs denote a category of country created in 1971 by the United Nations (UN). It groups together the least socio-economically developed countries in the globe. The list of LDCs is reviewed every three years by the Committee for Development Policy, an independent group of experts which reports to the United Nations Economic and Social Council. To date, this list includes 47 countries, including the DRC. See UNCTAD (2018) for more details.

<sup>6</sup>A note of caution merits discussion here about the cost of living. The CPI is not a cost of living index. We basically use it as an approximation of the true cost of living index. Blanchard et al. (2013, p. 27): “To measure the average price of consumption, or equivalently the cost of living index, macroeconomists look at another index, the consumer price index (CPI).”

typical household for Kinshasa —Kinshasa is the national capital and the largest city of the DRC. DRC is the second largest country in Africa with area of around 2.35 million square kilometers. However, its economy is weakly integrated as infrastructures are not sufficiently developed. Hence, most of the country’s economic activity is concentrated in the capital city Kinshasa. Therefore, we expect that the Covid-19 effect on different components of the basket of goods and services for a typical household in Kinshasa should be different from that of a typical household for the whole country (i.e. the DRC).

Figure 1: Consumer Price Index and New Covid-19 Contaminated Cases in the DRC. Period: January–June 2020.



Data on the total number of confirmed Covid-19 cases, recovered cases, deaths and new cases in the DRC are from the World Health Organization (WHO) database. Data on prices for various components of the basket of goods and services for an average consumer are extracted from the database of the National Statistical Office of the DRC. All data are in weekly frequencies and span the period from January 2019 to June 2020. except those related to Covid-19 which start from

March 2020<sup>7</sup>. Figure 1 shows the evolution of the CPI and the new Covid-19 contaminated cases in the DRC per week between January 2020 and June 2020. The CPI is plotted on the right axis and the number of new Covid-19 contaminated cases on the left axis. This figure suggests a strong positive correlation between the two variables, with a correlation coefficient of about 96.2 percent between March 10, 2020 and June 26, 2020. Others things being equal, this shows that the Covid-19 pandemic has considerably changed the dynamics of the general price level, leading to inflationary pressures. On March 10, 2020, a first case of Covid-19 infection was confirmed in the DRC. This date falls within the week where rumors circulated a lot in the media and social networks about the declaration of a public health emergency (PHE) by the President of the Republic<sup>8</sup>.

To quantitatively assess the Covid-19 effect on the cost of living in the DRC, we apply a simple two-step strategy. We compute the quasi-causal effect and the volatility differential for each household type, i.e. both for the typical household in Kinshasa and the typical household for the whole country. We show that, in absolute terms, the consumption basket for a typical household in Kinshasa exhibits both higher quasi-causal effect and volatility differential than those observed from the consumption basket of a typical household for the whole country (i.e. the DRC). We find that, in relative terms, the consumption basket for a typical household in Kinshasa exhibits higher quasi-causal effects than that for a typical household in DRC only in prices of food and non-alcoholic beverages and in prices of transport. More importantly, unlike developed countries where consumers spent more on food and other groceries during the Covid-19 pandemic, our results suggest that in response to the Covid-19 crisis, both the typical household in DRC and the typical household in Kinshasa spent more on health and communication. These findings highlight deep structural differences between developed countries, where health insurance is functional, and developing countries where patients generally face a deficit or lack of viable health insurance. Moreover, we argue expenditures on communication increased in response mainly to the lockdown measures, mobility restrictions or closing of national borders.

Furthermore, we also examine how the cost of living comoves with the government budget balance and exchange rate. Series on the public finance variables are from the Ministry of Finance. Additional data on the public finance include government revenue and government spending. Series on the interbank exchange rate and the parallel (or informal) exchange rate are from the Central Bank of Congo.<sup>9</sup> Basically, we note that, during the Covid-19 pandemic, the management of public

---

<sup>7</sup>This is due to the fact that a first case of Covid-19 was confirmed on March 10, 2020. Before this date, the series on new Covid-19 contaminated cases takes values 0 (see Figure 1 for illustration).

<sup>8</sup>The state of health emergency of one month was declared by the President of the Republic on March 24, 2020. See Ordonnance no. 20/014 of March 24, 2020 proclaiming a state of health emergency to deal with the Covid-19 pandemic. Afterwards, the state of emergency was successfully extended on: (i) April 23, 2020 (duration: 15 days); (ii) May 22, 2020 (duration: 15 days); (iii) June 5, 2020 (duration: 15 days); (iv) June 20, 2020 (duration: 15 days).

<sup>9</sup>In reference to [Kiguel and O'Connell \(1995, p. 22\)](#), the term parallel exchange rate refers to the financial rate in a dual system or to the black market rate in a black market system. Where a black market coexists with a dual system,

finances in the DRC and the uncertainty caused by deviations of the parallel exchange rate relative to the interbank exchange rate exacerbate the negative cost of living due to Covid-19 effect.

The rest of the paper is organized as follows. Section 2 briefly presents the related literature. Section 3 computes the effects of the Covid-19 pandemic on the prices of different components of the household basket of goods. We analyze these effects on the basket of goods for a typical household in DRC and for a typical household in Kinshasa. Section 4 explores the possible interactions between public finances, exchange rate, and the components of the household basket of goods. Section 5 concludes.

## 2 Related literature

Several studies have recently documented the socio-economic impact of the Covid-19 crisis in developed economies. One strand of the literature is interested in the effects of the Covid-19 pandemic on the financial market (see [He et al., 2020](#); [Landier and Thesmar, 2020](#); [Baker et al., 2020b](#)); other authors try to examine its consequences on households and businesses ([Chang and Meyerhoefer, 2020](#); [Cavallo, 2020](#); [Aum et al., 2020](#); [Coibion et al., 2020](#); [Barrero et al., 2020](#); [Krueger et al., 2020](#); [Baker et al., 2020a](#)). Another strand of the literature analyses the impact of Covid-19 pandemic on macroeconomic dynamics (see for example [Eichenbaum et al., 2020b](#), [Eichenbaum et al., 2020a](#), [Altig et al., 2020](#), [Hall et al., 2020](#); [Pindyck, 2020](#); [Jordà et al., 2020](#)). Our paper relates to the literature that focuses on the effects of the Covid-19 pandemic on the cost of living.

[Andersen et al. \(2020\)](#) study changes in consumer spending during the Covid-19 pandemic and the containment of the Danish economy using data from customer bank accounts from the largest bank of Denmark. They also examine the heterogeneity of consumer responses in the allocation of consumer spending and the mechanisms underlying shifts in consumer spending by estimating to which extent this decline varies among individuals. They find that total expenses, in the seven weeks following the containment, fell on average by 27% compared to the counterfactual level without the pandemic. This drop in spending is mainly concentrated in goods and services whose supply has been limited by the containment. Moreover, the patterns in spending in different categories is strongly correlated with the extent to which supply is restricted. For example, spending modestly rose in grocery stores and pharmacies, which remained open for the duration of the closure but decreased dramatically in sectors where restrictions were particularly severe, such as travel, restaurants and personal services.

---

one of the two parallel markets will typically be much larger, and the rate in this market is referred to as “the” parallel rate.

[Cavallo \(2020\)](#) analyzes the impact that changes in the structure of household spending have on the measurement of inflation (i.e. the change in the consumer price index) in 17 developed countries. He starts by updating the weighting coefficients of the components of the CPI with estimation techniques on high-frequency data of household credit card spending. Then, he derives another price index which he calls “Covid Basket”. He concludes that the global inflation is much higher than the official CPI during the Covid-19 pandemic. In April 2020, the annualized inflation rate of the Covid index in the United States was 1.06%, while the official CPI was only 0.35%. The increase in the Covid inflation is mainly explained by a rise in food spending and a fall in the weighting of transport prices. The difference is significant and growing over time as new social distancing rules and preferences restrain consumers from spending on deflationary components, such as transportation, thereby leading to more spending on food and other grocery products whose prices increase tremendously over time. He further estimates this impact for 16 other countries. For 10 countries of them, he finds that the Covid inflation is higher than the official CPI. For the remaining 6 countries, he concludes that the Covid inflation is much lower than the official CPI. Moreover, he shows that sudden changes in the structure of consumer spending leads to a bias in the CPI officially used to measure inflation. This bias can be positive depending on changes in the basket weights and the inflation rate registered. The results of this study suggest that the official CPI underestimates the cost of living for an average consumer and that real consumption drops more rapidly over time.

[Baker et al. \(2020b\)](#) attempt to understand how household consumption reacts to epidemics by using data on financial transactions of American households from August 2016 to March 2020. They note that at the outset, spending increased sharply especially in the retailing and food sector because of precautionary motives (i.e. they store essential goods expecting the inability to visit stores). the global household spending rose on average by about 50% between February 26 and March 11. Grocery spending remained high until March 27 then increased to 7.5% compared to the beginning of the year. This increase has been followed by a drastic drop in the global spending. In addition, the study explores the heterogeneity of partisan affiliations, demographics and incomes that are closely linked to declared beliefs about the impact of the new virus. According to a poll (conducted between March 5 and 9), 62 percent of Republicans thought that the Covid-19 threat was greatly over-stressed, while only 31 percent of Democrats and 35 percent of independents thought the same.

[Coibion et al. \(2020\)](#) use several waves of customized surveys to study the economic costs of containment in the US in terms of spending, labor market outcomes and macroeconomic expectations. They find that consumer spending for a typical American household fell by 1,000 American dollar per month between January and April 2020. This corresponds to a 31 percent drop in the global spending. Households also spent much less for the category of goods whose

supply was restricted by containment measures including durable goods. In line with these negative results at the individual level, households macroeconomic expectations have become much more pessimistic. The average perception of the current unemployment rate has risen by 11 percentage points. In assessing the economic damage that households attribute to the Covid-19 crisis, 42 percent of respondents declare that they lost more than 5,000 US dollars. In addition, more than 50 percent of respondents with financial assets reported that they lost an average of 33,000 American dollars.

In Africa, [Morsy et al. \(2020\)](#) evaluate the effects of the Covid-19 pandemic on African economies and household well-being using a micro-macro-simulation approach. In this study, the pandemic is modeled as a supply shock that disrupts the economic activities of African countries and then affects households, their consumption behavior, the level of their well-being and even investment decisions by firms. They calibrate their model by taking into account the informal economy, a key feature of African economies. Then, they use their analytical framework and analyze the effects of different fiscal policy measures taken as a result. Their results suggest that the Covid-19 shock may have decreased employment both in the formal and informal sectors and reduce the level of consumption. These contractions could lead to an economic recession in Africa and to the widening of both the budget and current account deficits. Extreme poverty is expected to increase much more in Africa, in particular, if the well-being of the poorest households experiences low growth.

[Nonvide \(2020\)](#) simulates the impact of Covid-19 pandemic on poverty in Africa using Povcal-Net data from the World Bank. Using three scenarios of contraction in consumption (low, medium and high) and based on the poverty line of 1.9 dollars per day, he discovers that the number of poor people in Africa could increase from 59 to 200 million due to the Covid-19 pandemic.

### 3 The Effects of Covid-19 on Cost of Living in the DRC

We propose a two-step approach to assess the effect of Covid-19 pandemic on the prices of the various components of the household basket of goods in DRC. The first step is comparable to the counterfactual analysis<sup>10</sup>, where the quasi-causal effect  $\Delta_{i,t}$  for a component  $i$  at date  $t$  is such that:

$$\Delta_{i,t} = \left( y_{i,t}^{+covid19} - y_{i,t-1}^{+covid19} \right) - \left( y_{i,t}^{-covid19} - y_{i,t-1}^{-covid19} \right) \quad (1)$$

where  $y_{i,t}^{+covid19}$  denotes the variable of interest  $i$  at time  $t$  in the presence of the Covid-19 pandemic,  $y_{i,t}^{-covid19}$  denotes the variable of interest  $i$  at time  $t$  in the absence of the Covid-19 pandemic, for  $i = 1, 2, \dots, N + 1$ ,  $t = 1, 2, \dots, T$ . The index  $i$  denotes the different components of the household

<sup>10</sup>See, for instance, [Givord \(2014\)](#) for a review.

basket respectively,  $N$  is the total number of components of this basket. The index  $i$  goes to  $N + 1$  since this formula also applies to the global basket (i.e. the basket which groups all the  $N$  components). Finally, the index  $t$  denotes the time, measured in these weeks. From equation (1), we compute  $\mathbb{E} \{\Delta_{i,t}\}$ , that is the mean of the series  $\Delta_{i,t}$ . If this mean is significantly different from zero, then we conclude that the effect of the pandemic on the variable of interest is significant. Otherwise, we conclude that the pandemic had no impact on the dynamics of the corresponding variable of interest. Subsequently, we complete the first step of our strategy by computing, for each variable, the volatility differential of the ‘‘Covid-19 effect’’  $\Psi_i$ :

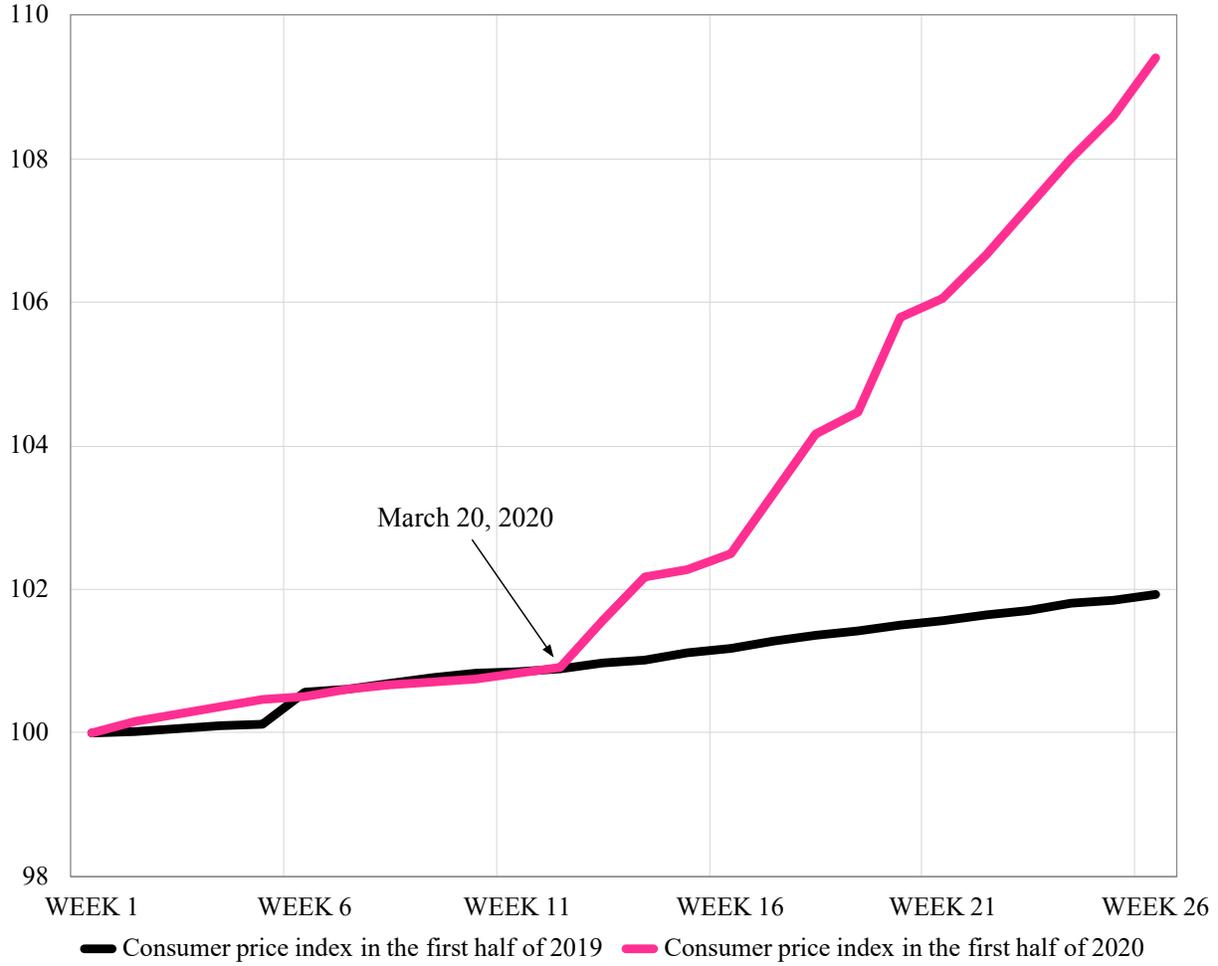
$$\Psi_i = \left( \text{var} \left\{ y_{i,t}^{+covid19} - y_{i,t-1}^{+covid19} \right\} \right)^{\frac{1}{2}} - \left( \text{var} \left\{ y_{i,t}^{-covid19} - y_{i,t-1}^{-covid19} \right\} \right)^{\frac{1}{2}} \quad (2)$$

where  $\left( \text{var} \left\{ y_{i,t}^{+covid19} - y_{i,t-1}^{+covid19} \right\} \right)^{\frac{1}{2}}$  denotes the absolute volatility of the variable of interest  $i$  at time  $t$  in the presence of the Covid-19 pandemic,  $\left( \text{var} \left\{ y_{i,t}^{-covid19} - y_{i,t-1}^{-covid19} \right\} \right)^{\frac{1}{2}}$  denotes the absolute volatility of the variable of interest  $i$  at time  $t$  in the absence of the Covid-19. To construct our variables of interest in the presence and absence of the Covid-19 pandemic, we consider the first half of 2019 and 2020. The variables of interest in the presence of the pandemic are those that are observed during the period spanning March 13, 2020 to June 26, 2020 (i.e from the 11th to the 26th week of 2020). The variables of interest in the absence of the pandemic are those observed from March 15, 2019 to June 28, 2019 (i.e. from the 11th to the 26th week of 2019). Figure 2 provides an illustration, where for each year, the value taken by the CPI for each week is divided by the value taken in the first week of the corresponding year, multiplied by 100. Unlike the first step, which computes the absolute effect of the pandemic on prices of different components of the household basket of goods, the second step quantifies the relative effect. We compute the relative effect of the pandemic on the prices of different components of the household basket in terms of quasi-causal effect,  $\Delta_{i,t}^*$ .

$$\Delta_{i,t}^* = \frac{\mathbb{E} \left\{ y_{i,t}^{+covid19} - y_{i,t-1}^{+covid19} \right\}}{\mathbb{E} \left\{ CPI_{i,t}^{+covid19} - CPI_{i,t-1}^{+covid19} \right\}} - \frac{\mathbb{E} \left\{ y_{i,t}^{-covid19} - y_{i,t-1}^{-covid19} \right\}}{\mathbb{E} \left\{ CPI_{i,t}^{-covid19} - CPI_{i,t-1}^{-covid19} \right\}} \quad (3)$$

where  $CPI_{i,t}^{+covid19}$  denotes the CPI  $i$  at time  $t$  in the presence of Covid-19 pandemic.  $CPI_{i,t}^{-covid19}$  denotes the CPI  $i$  at time  $t$  in the absence of Covid-19 pandemic. We quantify the relative effect of Covid-19 pandemic on the prices of various components of the household basket in terms of

Figure 2: Consumer Price Index in the first half of 2020 compared to the first half of 2019



volatility differential  $\Psi_i^*$  :

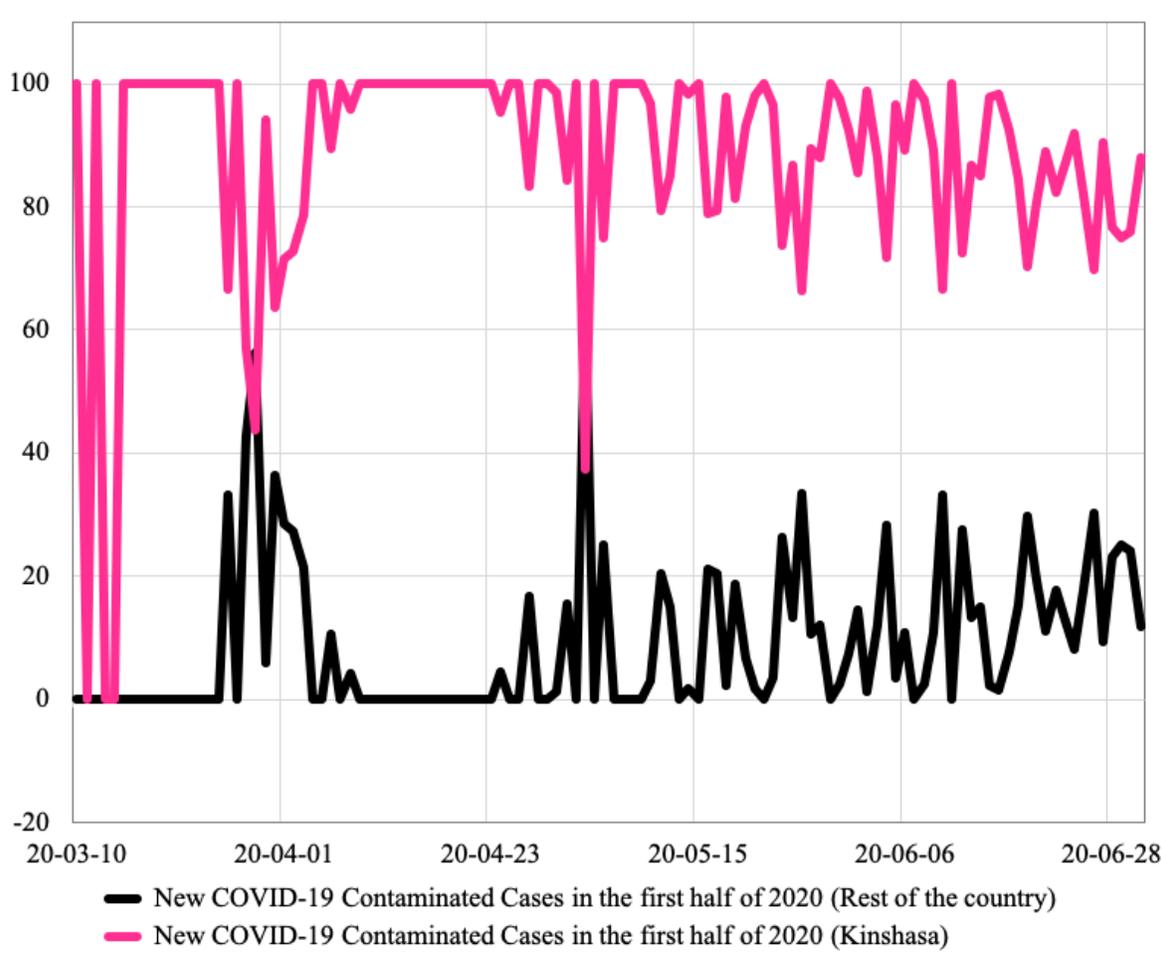
$$\Psi_i^* = \left( \frac{\text{var} \{y_{i,t}^{+covid19} - y_{i,t-1}^{+covid19}\}}{\text{var} \{CPI_{i,t}^{+covid19} - CPI_{i,t-1}^{+covid19}\}} \right)^{\frac{1}{2}} - \left( \frac{\text{var} \{y_{i,t}^{-covid19} - y_{i,t-1}^{-covid19}\}}{\text{var} \{CPI_{i,t}^{-covid19} - CPI_{i,t-1}^{-covid19}\}} \right)^{\frac{1}{2}} \quad (4)$$

We report the results of the effect of the Covid-19 pandemic (in absolute terms) obtained from the first stage in Table 1. Table 2 presents the results obtained from the second stage (i.e. the Covid-19 effect in relative terms). In general, it appears that the prices of the various components of the household basket for both the typical household in DRC and the typical household in Kinshasa have experienced inflationary pressures both in the average and volatility following the Covid-19 shock. In absolute terms, the quasi-causal effect of the component that recorded the largest value, both

for the typical household in DRC and the typical household in Kinshasa was that of health<sup>11</sup>. The quasi-causal effect of the health component amounts to 1.14 for the typical household in DRC and 1.06 for the typical household in Kinshasa. Furthermore, the volatility differential of the component that registered the largest value is that of communication for the typical household<sup>12</sup> in DRC and health for the typical household in Kinshasa. The volatility differential of the communication component is 0.98 for the typical household in DRC and 0.93 for the typical household in Kinshasa.

These findings suggest that after the Covid-19 shock, the typical household in DRC was primarily concerned about health and communication, while the typical household in Kinshasa was fundamentally concerned about health. The fact that the typical household in Kinshasa is mainly concerned for health can be based on the grounds that Kinshasa is the city that counted the largest number of people infected with Covid-19 in the first half of 2020.

Figure 3: Share of people infected to Covid-19 during the first half of 2020



<sup>11</sup>The 'health' component includes (i) drugs and other pharmaceutical products, therapeutic devices and materials, (ii) non-hospital medical and paramedical services, (iii) hospital services.

<sup>12</sup>The communication component includes (i) postal services, (ii) telephone and (iii) telegraph.

Table 1: Absolute effect of Covid-19 on prices of various components of household basket

	CPI (DRC)			CPI (Kinshasa)		
	2019	2020	$\Delta_{i,t}^*$	2019	2020	$\Delta_{i,t}^*$
Panel 1: Quasi-causal effect						
Food and non-alcoholic beverages	0.109	0.458	0.348	0.076	0.449	0.373
Alcoholic beverage and tobacco	0.012	0.416	0.404	0.136	0.400	0.264
Clothes and shoes	0.017	0.643	0.626	0.034	0.776	0.741
Accommodation, water, gas, electricity and other combustibles	0.025	0.641	0.616	0.107	0.580	0.473
Furniture, household items and house maintenance	0.073	0.464	0.391	0.168	0.651	0.483
Health	0.002	1.142	1.140	0.024	1.088	1.064
Transports	0.025	0.292	0.268	0.020	0.359	0.339
Communications	0.017	0.516	0.499	0.041	0.504	0.463
Entertainment and culture	0.000	0.343	0.343	0.020	0.635	0.614
Teachings	0.003	0.686	0.682	0.040	0.605	0.565
Restaurants and hotels	0.009	0.769	0.760	0.064	0.732	0.669
Other goods and services	0.024	0.779	0.756	0.044	0.717	0.673
Global index	0.081	0.511	0.430	0.069	0.541	0.472
Panel 2: Volatility						
Food and nonalcoholic beverages	0.035	0.244	0.210	0.054	0.334	0.281
Alcoholic beverage and tobacco	0.028	0.364	0.336	0.330	0.599	0.269
Clothes and shoes	0.046	0.873	0.828	0.052	0.790	0.739
Accommodation, water, gas, electricity and other combustibles	0.036	0.581	0.546	0.116	0.467	0.351
Furniture, household items and house maintenance	0.224	0.480	0.256	0.309	0.673	0.364
Health	0.005	0.795	0.791	0.054	0.991	0.937
Transports	0.083	0.250	0.166	0.036	0.623	0.588
Communications	0.034	0.821	0.987	0.107	0.534	0.427
Entertainment and culture	0.000	0.353	0.353	0.061	0.574	0.512
Teaching	0.013	0.850	0.837	0.161	0.777	0.616
Restaurants and hotels	0.024	0.751	0.727	0.170	0.656	0.486
Other goods and services	0.049	0.823	0.774	0.119	0.544	0.426
Global index	0.025	0.308	0.283	0.024	0.343	0.320

Figure 3 presents the dynamics in share of people infected to Covid-19 during the first half of 2020 in Kinshasa and in the rest of the country. Furthermore, policies adopted by the government to mitigate the spread of the the Covid-19 epidemics such as containment measures and the closing of national borders may justify the high volatility registered in the communication component. In absence of physical gathering, consumers were forced to increase their communication budget so as to keep in touch with family members, work colleagues or other acquaintances and friends.

The volatility of the price of the “communication” component can also be justified by the need to use internet services to keep up with the evolution of the pandemic and announcements from the government and various medical services such additional strict measures to be observed during the state of health emergency.

Table 2 shows the relative effect of Covid-19 on the prices of various components of the household basket of goods. In relative terms, the quasi-causal effect of the component that records the largest value, both for the typical household in DRC and Kinshasa is health. The quasi-causal effect on the health component is 2.21 for the typical household in DRC and 1.66 for the typical household in Kinshasa. Similarly, the volatility differential of the component that has the greatest value both for the typical household in DRC and Kinshasa is health once again.

In Table 3, we summarize the results of the relative effect of Covid-19 on the prices of various components of the household basket in Kinshasa compared to the national level. In absolute terms, the Covid-19 pandemic has a higher effect on the household basket of goods for the typical household in Kinshasa than for the rest of the country. The quasi-causal effect differential and the volatility in the prices of the household basket of goods for the typical household in Kinshasa compared to the average household in DRC are 0.042 and 0.037 respectively. For the basket components, the Covid-19 effect differential is higher for the prices of food and non-alcoholic beverages, clothing and footwear, furniture, household items and household maintenance, transport, entertainment and culture have a higher quasi-causal effect for the typical household in Kinshasa than the rest of the country. This pattern is not the same when we consider the differential in relative terms. In relative terms, the quasi-causal effect is much higher for the prices of food and non-alcoholic beverages, transport, leisure and culture for the average household in Kinshasa than the rest of the country. As far as volatility is concerned, the quasi-causal effect on the prices of food and non-alcoholic beverages, furniture, household items and household maintenance, health, transport, entertainment and culture components are higher for the average household in Kinshasa than the rest of the country. To sum up, our findings suggest that the Covid-19 shock triggers drastic changes in the prices of various components of the household basket. In developing countries where a great share of economic activity is concentrated in capital cities, we expect the Covid-19 shock to have a sizable impact on the household basket for the typical household in the capital city than the rest of the country. This evidence is only partially ascertained by our results. In absolute terms, the Covid-19

Table 2: Relative effect of COVID-19 on prices of components of household basket

	CPI (DRC)			CPI (Kinshasa)		
	2019	2020	$\Delta_{i,t}^*$	2019	2020	$\Delta_{i,t}^*$
Quasi-causal effect						
Food and nonalcoholic beverages	1.357	0.896	-0.461	1.104	0.830	-0.274
Alcoholic beverage and tobacco	0.149	0.815	0.666	1.975	0.739	-1.236
Clothes and shoes	0.210	1.259	1.048	0.496	1.433	0.937
Accommodation, water, gas, electricity and other combustibles	0.316	1.255	0.939	1.551	1.072	-0.480
Furniture, household items and house maintenance	0.910	0.909	-0.001	2.438	1.203	-1.235
Health	0.026	2.235	2.209	0.349	2.010	1.661
Transports	0.304	0.572	0.268	0.293	0.663	0.370
Communications	0.212	1.010	0.797	0.590	0.931	0.341
Entertainment and culture	0.000	0.671	0.671	0.295	1.173	0.877
Teaching	0.040	1.342	1.302	0.586	1.118	0.532
Restaurants and hotels	0.113	1.505	1.392	0.923	1.353	0.430
Other goods and services	0.292	1.525	1.233	0.632	1.324	0.692
Global index	1.000	1.000	0.000	1.000	1.000	0.000
Volatility						
Food and non-alcoholic beverages	1.400	0.793	-0.606	2.262	0.974	-1.288
Alcoholic beverage and tobacco	1.115	1.182	0.067	13.938	1.744	-12.19
Clothes and shoes	1.850	2.839	0.989	2.178	2.303	0.126
Accommodation, water, gas, electricity and other combustibles	1.455	1.890	0.435	4.921	1.362	-3.559
Furniture, household items and house maintenance	9.065	1.560	-7.505	13.069	1.962	-11.11
Health	0.188	2.585	2.397	2.278	2.888	0.610
Transports	3.378	0.812	-2.565	1.501	1.816	0.315
Communications	1.365	2.669	1.304	4.517	1.556	-2.961
Entertainment and culture	0.000	1.146	1.146	2.596	1.671	-0.925
Teaching	0.525	2.763	2.238	6.821	2.264	-4.557
Restaurants and hotels	0.976	2.441	1.466	7.182	1.911	-5.271
Other goods and services	2.002	2.676	0.674	5.011	1.587	-3.424
Global index	1.000	1.000	0.000	1.000	1.000	0.000

Table 3: Relative effect of Covid-19 on prices of components of the household basket in Kinshasa compared to the national level

	$\Delta_{i,t}^*$ Kinshasa/DRC Absolute effect		$\Delta_{i,t}^*$ Kinshasa/DRC Relative effect	
	Quasi-causal effect	Volatility	Quasi-causal effect	Volatility
Food and non-alcoholic beverages	0.025	0.071	0.188	-0.681
Alcoholic beverage and tobacco	-0.140	-0.067	-1.902	-12.261
Clothing and footwear	0.115	-0.089	-0.111	-0.863
Accommodation, water, gas, electricity and other combustibles	-0.143	-0.194	-1.419	-3.995
Furniture, household items and household maintenance	0.092	0.108	-1.234	-3.602
Health	-0.076	0.147	-0.548	-1.787
Transports	0.071	0.421	0.102	2.880
Communications	-0.036	-0.360	-0.457	-4.265
Entertainment and culture	0.271	0.160	0.206	-2.071
Teaching	-0.118	-0.221	-0.770	-6.795
Restaurants and hotels	-0.091	-0.241	-0.962	-6.737
Other goods and services	-0.082	-0.348	-0.541	-4.098
Global index	0.042	0.037	0.000	0.000

effect has been higher for the household basket of goods for the typical household in Kinshasa than the rest of the country. In relative terms, the quasi-causal effect is much higher on the prices of food and non-alcoholic beverages, transport, entertainment and culture for the average household in Kinshasa than the rest of the country. For the other components of the household basket, the impact of the Covid-19 shock is greater for the household in DRC than in Kinshasa. Given the above, it appears that the Covid-19 shock leads to drastic changes in the prices of various components of the household basket both for the household in Kinshasa and the rest of the country. These results have policy implications in that sudden changes such as those caused by the Covid-19 crisis can introduce significant biases in the use of CPI as a measure of inflation. Recent studies show that such biases would make it difficult to interpret inflation. It appears that in times of crisis, like the current Covid-19 pandemic, the cost of living for the average consumer increases considerably. *Ceteris paribus*, this implies that real consumption will tend to decline more rapidly during the crisis period. In addition, given that the Covid-19 pandemic involves slowing down or shutting down a great share of economic activities (shopping centers, hotels, transport, tourism, etc.), we would expect a higher level of unemployment and additional welfare effects to further raise the cost of living for the average consumer.

## **4 Public finance, exchange rate and cost of living during the pandemic**

Our results in the previous section exhibit that the pandemic tends to rise the cost of living for the average consumer. In this context, the role of the government should be to help vulnerable households. In response to this objective, the government launched in June 2020 the “Programme multisectoriel d’urgence d’atténuation des impacts de la Covid-19 en RDC” (PMUAIC-19, see [Ministère du Plan 2020](#)). From a macroeconomic policy perspective, this program urges the government and the central bank to coordinate efforts in order to mitigate the propagation of the virus within the country and contribute towards maintaining the country’s economic and social stability. The program has four operational objectives: (i) limit the spread of Covid-19 and ensure proper patient care; (ii) ease the supply of imported essential goods and products; (iii) facilitate the financing of urgent targeted public expenditure; (iv) mitigate the effects of the crisis on the productive system, employment and purchasing power ([Ministère du Plan 2020](#), p. 94). In the rest of this section, we explore the interaction between the budget deficit, the exchange rate and the components of the household basket of goods. Figure 4 presents the evolution of aggregate government revenue, government spending and government deficit respectively during the first half of 2019 and 2020. While government revenue is much higher in 2019 than 2020 for the same period

(i.e. for the 26 weeks of the first semester); an opposite pattern is observed for public spending. For the same period, public spending is lower in 2019 than 2020. Thus, the average public finance balance in 2020 is approximately twice (around 1.97) than the one in 2019. Based on the behavior of the main fiscal policy aggregates, we argue that the Covid-19 crisis disrupts the correlations between fiscal policy variables and the prices of various components of the household basket and leads to an increase in the cost of living. To verify this claim, we compute the correlation vector between the fiscal policy variables and the prices of various components of the household basket. We mainly focus on the budget balance. We complete our analysis by also exploring the effect of uncertainty triggered by the exchange rate differential on the prices of various components of the household basket. Figure 5 shows the variation in the inter-bank exchange rate and the parallel exchange rate compared to their respective initial values in early January.

Prior to analyzing the results summarized in Table 4, let us clarify at least two things about the cyclical correlation between the prices of various components of the household basket, the budget balance and the exchange rate differential (i.e. the cyclical difference between the interbank exchange rate and the parallel exchange rate). Figure 4 shows that in the first half of 2020, the public finance deficit rose compared to its level in the same period in 2019. Thus, a positive cyclical correlation between the price of a household basket or under basket and the budget balance would entail that the worsening of the budget balance is followed by an increase in the cost of living. In this case an accumulation of budget deficits would further erode the purchasing power of income and the standard of living of the average consumer.

Figure 4: Government revenue, government spending, and government deficit in 2019-S1 et 2020-S2

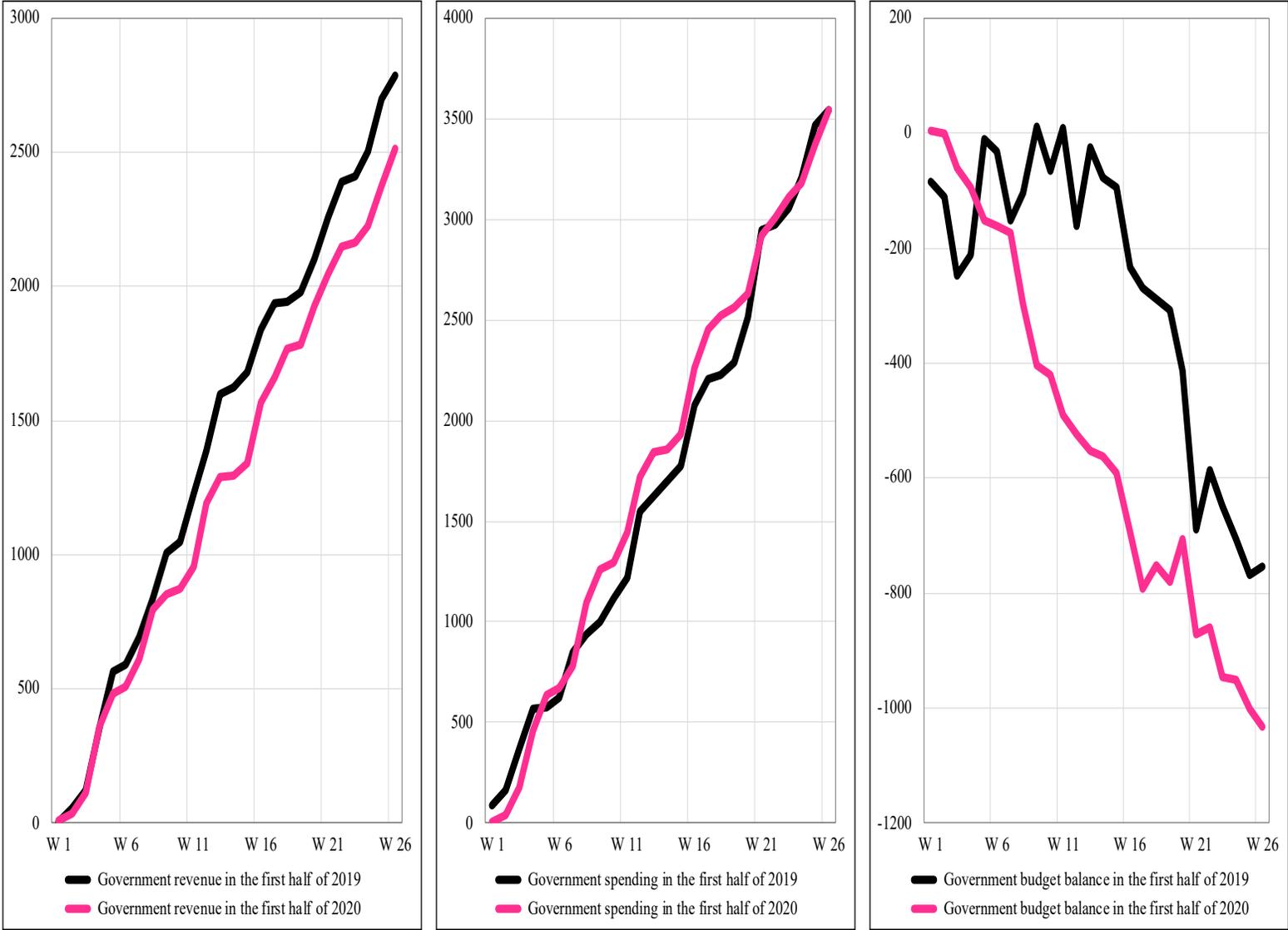


Figure 5: Exchange rate in the first half of 2020 compared to the first half of 2019

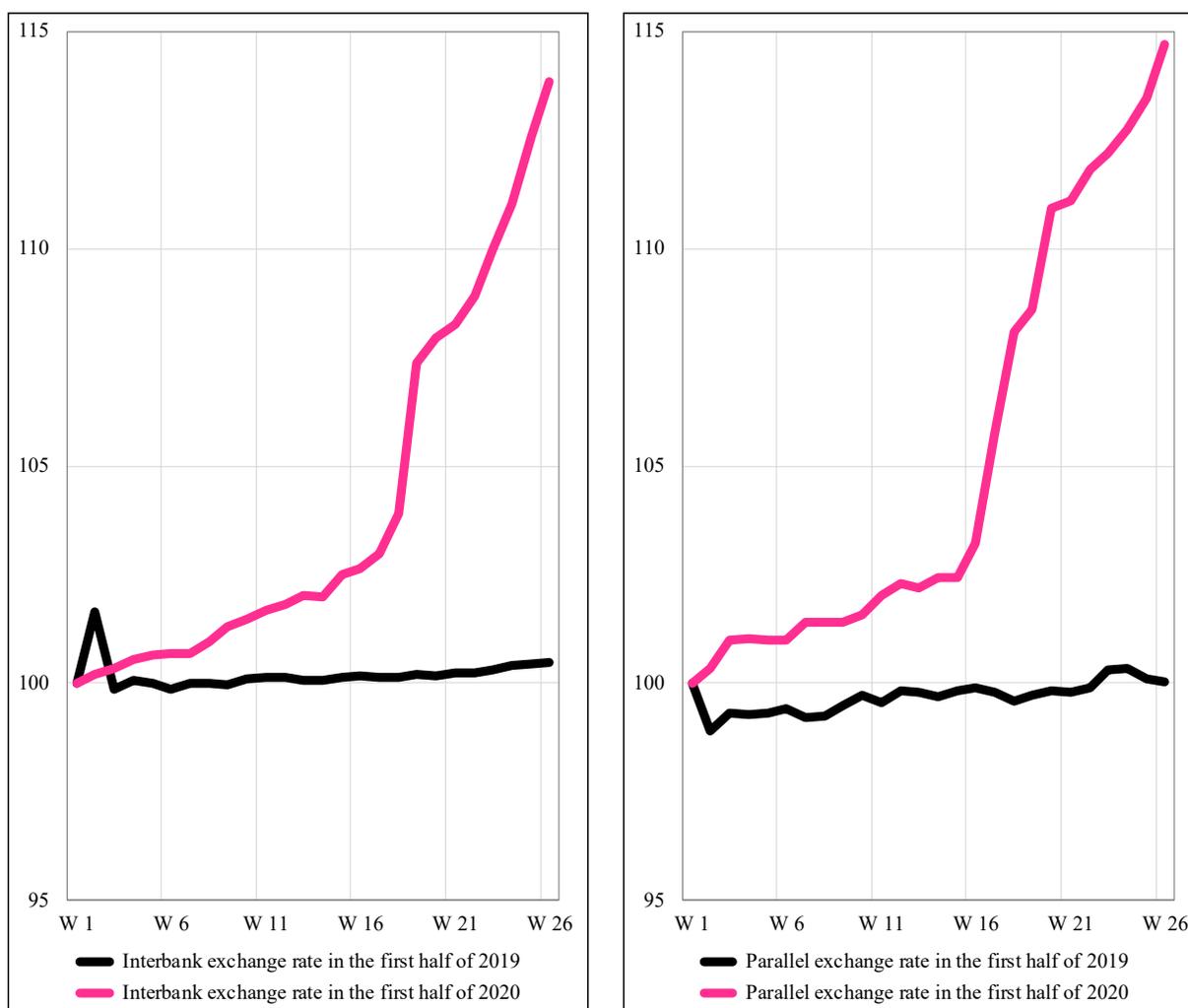


Figure 5 confirms that in the first half of 2020, the exchange rate differential increased sharply compared to its level in the same period in 2019. Hence, a positive cyclical correlation between the price of a household basket or under basket and the exchange differential means that the widening of the gap between the inter-bank exchange rate and the parallel exchange rate goes along with a rise in the cost of living.

Table 4 synthesizes the cyclical correlation between the prices of various components of the household basket, the budget balance and the exchange rate differential. These results are in line with Figures 4 and 5. Our findings reveal that at the outset of the Covid-19 shock, the public finance deficit deepens further and is accompanied by a hike in the cost of living both for the typical household in DRC and Kinshasa. A similar argument can be made for the exchange rate differential. Following the Covid-19 shock, the uncertainty generated by the exchange rate differential rises and is accompanied with an increase in the cost of living for both for the typical household in DRC and

Table 4: Relative effect of Covid-19 on prices of components of the household basket in Kinshasa compared to the national level

	Before Covid-19 shock		After Covid-19 shock	
	Balance budget	Exchange rate difference	Balance budget	Exchange rate difference
<b>CPI (DRC)</b>				
Food and non-alcoholic beverages	0.293	-0.095	0.316	0.334
Alcoholic beverages and tobacco	-0.166	-0.078	0.340	0.434
Clothing items and footwear	-0.049	-0.318	0.352	0.326
Accommodation, water, gas, electricity and other combustibles	-0.122	0.327	0.457	0.332
Furniture, household items and house maintenance	0.027	0.102	0.300	0.373
Health	0.137	-0.140	0.310	0.125
Transports	0.294	0.392	0.439	0.579
Communications	0.414	0.345	0.284	0.345
Entertainment and culture	. . .	. . .	0.347	0.465
Teaching	-0.141	0.192	0.311	0.253
Restaurants and hotels	-0.112	0.226	0.417	0.433
Other goods and services	0.192	-0.272	0.303	0.069
Global index	0.317	-0.025	0.498	0.469
<b>CPI (Kinshasa)</b>				
Food and non-alcoholic beverages	0.440	0.316	0.316	0.334
Alcoholic beverages and tobacco	-0.328	0.340	0.340	0.434
Clothing items and shoes	0.331	0.352	0.352	0.326
Accommodation, water, gas, electricity and other combustibles	0.322	0.457	0.457	0.332
Furniture, household items and house maintenance	-0.190	0.300	0.300	0.373
Health	-0.056	0.310	0.310	0.125
Transports	-0.110	0.439	0.439	0.579
Communications	0.036	0.284	0.284	0.345
Entertainment and culture	0.119	0.347	0.347	0.465
Teaching	-0.141	0.311	0.311	0.253
Restaurants and hotels	-0.218	0.417	0.417	0.433
Other goods and services	-0.112	0.303	0.303	0.069
Global index	0.477	0.498	0.498	0.469

Kinshasa.

To sum up, all our findings, as explained in previous sections, suggest that the cost of living for the average consumer has sharply risen following the Covid-19 shock. In this context, the priority for the government is to assist vulnerable households. The main goal of our experiment in this section was to examine to what extent the Covid-19 crisis disrupts the correlations between fiscal policy variables and the prices of components of the household basket of goods, in the sense of rising cost of living. Our evidence in Table 4 confirms this claim. In other words, our findings support that the efforts by the government to mitigate the uncertainty related to Covid-19 pandemic or to ensure an efficient management of public finances have not been accompanied by measures to protect the purchasing power of the average consumer's income. We note that during the pandemic there has been a sharp increase in the cost of living, a rise in uncertainty and a surge in public finance deficit. These findings support the negative character of our earlier findings.

Recently, the literature related to the analysis of the socio-economic impact of the Covid-19 shock has grown rapidly. In the following section, we offer a snapshot of the literature mostly closely related to our work.

## 5 Conclusion

Several studies in the recent economic literature show the COVID-19 pandemic has had drastic effects on consumer spending in developed countries. In this paper, we contribute to the literature by providing new evidence about significant changes that occurred in the prices of various components of the basket of goods and services for an average consumer in response to the pandemic in developing countries. For our experiment, we use high frequency macroeconomic series and Covid-19 related health data for the Democratic Republic of Congo (DRC), an economy ranked among the least developed countries in the world.

We follow a two-step approach in order to quantitatively assess in both absolute and relative terms the quasi-causal effect and the volatility differential triggered by the Covid-19 shock on the cost of living in DRC. To this end, we distinguish two types of households: a representative household for the whole country (i.e. DRC) and a representative household for Kinshasa, the capital city and the largest city of DRC. Our results show that: First, in absolute terms, the consumption basket for the typical household in Kinshasa registered both higher Covid-19 effects than those observed from the basket of the typical household in DRC. Second, In relative terms, we show that the pandemic exhibits high quasi-causal effects for the typical household in Kinshasa than for DRC only in the price of food and non-alcoholic beverages and the price of transport. Many studies have ascertained that during the Covid-19 crisis consumers in developed economies have spent a large share of income on food and other groceries but have allocated a less portion to transport,

hotels, restaurants or entertainment. In contrast, we show that the Covid-19 shock has caused the typical household in DRC to spend more on health and communication services. In similar way, the pandemic has pushed the average consumer in Kinshasa to spend more on health. Furthermore, we also discover that the average consumer in DRC and Kinshasa have devoted more funding to communication services (telephone and internet) following the containment measures and mobility restrictions. These findings confirm structural differences that exist between developed countries, where health insurance is fully operational and developing countries where patients generally face a deficit or lack of viable health insurance. In addition, we examined how the Covid-19 shock has disrupted correlations between fiscal policy variables and the prices of various components of the consumer basket, thereby leading to higher cost of living and inflationary pressures. In light of our evidence, we argue that the joint efforts by the government to mitigate the uncertainty related to the Covid-19 pandemic and ensure an efficient management of public finances have not followed up with strong measures aimed at preserving the loss in purchasing power of the average consumer. Instead, we believe that the pandemic has generated a drastic rise in the cost of living, increased uncertainty and enlarged the budget deficit. These findings have contributed to amplify the negative effect of the pandemic on cost of living.

To conclude, we underline that the findings of this paper should be apprehended as a first step towards a formal analysis of the economic impact of the Covid-19 shock within the context of developing and emerging economies. As such, our paper can be further improved in several dimensions in the future. One direction could be to develop a structural model which combines a cyclical model, with several features of developing economies such as the informal economy and capable of matching stylized facts of these economies with an epidemiological model (e.g. the Susceptible Infected Recovered model). Subsequently, this resulting analytical framework can be used to study the impact of the pandemic shock on macroeconomic dynamics, compute co-movements between different variables of interest and assess the efficacy of alternative policies.

## References

- Acemoglu, D., Johnson, S., Robinson, J.A., 2005. Institutions as the Fundamental Cause of Long-Run Growth, in: Handbook of Economic Growth. Philippe Aghion ad, Steven N. Durlauf. volume 1, Part A. chapter 6, pp. 385–472. URL: [http://dx.doi.org/10.1016/S1574-0684\(05\)01006-3](http://dx.doi.org/10.1016/S1574-0684(05)01006-3).
- Altig, D., Baker, S.R., Barrero, J.M., Bloom, N., Bunn, P., Chen, S., Davis, S.J., Leather, J., Meyer, B.H., Mihaylov, E., Mizen, P., Parker, N.B., Renault, T., Smietanka, Pawel andThwaites, G., 2020.

- Economic Uncertainty Before and During the COVID-19 Pandemic. NBER Working 27418. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w27418>.
- Andersen, A.L., Hansen, E.T., Johannesen, N., Sheridan, A., 2020. Consumer Responses to the COVID-19 Crisis. CEPR Vox EU. Centre for Economic Policy Research. URL: <http://voxeu.org/article/consumer-responses-covid-19-crisis>.
- Aum, S., Lee, S.Y.T., Shin, Y., 2020. COVID-19 Doesn't Need Lockdowns to Destroy Jobs: The Effect of Local Outbreaks in Korea. NBER Working Paper 27264. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w27264>.
- Baker, S.R., Bloom, N., Davis, S.J., Kost, K.J., Sammon, M.C., Viratyosin, T., 2020a. The Unprecedented Stock Market Impact of COVID-19. NBER Working Paper 26945. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w26945>.
- Baker, S.R., Farrokhnia, R.A., Meyer, S., Pagel, M., Yannelis, C., 2020b. How Does Household Spending Respond to an Epidemic? Consumption During the 2020 COVID-19 Pandemic. NBER Working Paper 26949. National Bureau of Economic Research. URL: <https://www.nber.org/papers/w26949>.
- Barrero, J.M., Bloom, N., Davis, S.J., 2020. COVID-19 Is Also a Reallocation Shock. NBER Working Paper 27137. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w27137>.
- Blanchard, O., Cohen, D., Johnson, D., 2013. Macroeconomics, sixth Edition. Pearson. URL: <http://www.pearsonhighered.com/product/Blanchard-Macroeconomics-6th-Edition/9780133061635.html>.
- Buehn, A., Schneider, F., 2012. Shadow Economies Around the World: Novel Insights, Accepted Knowledge, and New Estimates. *International Tax and Public Finance* 19, 139–171. URL: <http://doi.org/10.1007/s10797-011-9187-7>.
- Cavallo, A., 2020. Inflation with Covid Consumption Baskets. NBER Working Paper 27352. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w27352>.
- Chang, H.H., Meyerhoefer, C., 2020. COVID-19 and the Demand for Online Food Shopping Services: Empirical Evidence from Taiwan. NBER Working Paper 27427. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w27427>.
- Coibion, O., Gorodnichenko, Y., Weber, M., 2020. The Cost of the Covid-19 Crisis: Lockdowns, Macroeconomic Expectations, and Consumer Spending. NBER Working Paper 27141. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w27141>.

- Eichenbaum, M.S., Rebelo, S., Trabandt, M., 2020a. Epidemics in the Neoclassical and New Keynesian Models. NBER Working Paper 27430. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w27430>.
- Eichenbaum, M.S., Rebelo, S., Trabandt, M., 2020b. The Macroeconomics of Epidemics. NBER Working Paper 26882. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w26882>.
- Givord, P., 2014. Méthodes économétriques pour l'évaluation de politiques publiques. *Économie & Prévision* 1–2, 1–28. URL: <http://www.cairn.info/revue-economie-et-prevision-2014-1-page-1.htm>.
- Hall, R.E., Jones, C.I., Klenow, P.J., 2020. Trading Off Consumption and COVID-19 Deaths. NBER Working Paper 27340. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w27340>.
- He, Z., Nagel, S., Song, Z., 2020. Treasury Inconvenience Yields during the COVID-19 Crisis. NBER Working Paper 27416. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w27416>.
- ILO, 2004. Consumer Price Index Manual: Theory and Practice. ILO Manual, International Labour Organization. URL: [http://www.ilo.org/global/statistics-and-databases/WCMS\\_331153/lang--en/index.htm](http://www.ilo.org/global/statistics-and-databases/WCMS_331153/lang--en/index.htm).
- Jordà, Ò., Singh, S.R., Taylor, A.M., 2020. Longer-Run Economic Consequences of Pandemics. NBER Working Paper 26934. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w26934>.
- Kiguel, M., O'Connell, S.A., 1995. Parallel Exchange Rates in Developing Countries. *The World Bank Research Observer* 10, 21–52. URL: <http://www.jstor.org/stable/3986565>.
- Krueger, D., Uhlig, H., Xie, T., 2020. Macroeconomic Dynamics and Reallocation in an Epidemic. NBER Working Paper 27047. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w27047>.
- La Porta, R., Shleifer, A., 2014. Informality and Development. *The Journal of Economic Perspectives* 28, 109–126. URL: <http://www.jstor.org/stable/23800578>.
- Landier, A., Thesmar, D., 2020. Earnings Expectations in the COVID Crisis. NBER Working Paper 27160. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w27160>.

- Maloney, W.F., 2004. Informality revisited. *World Development* 32, 1159–1178. URL: <https://doi.org/10.1016/j.worlddev.2004.01.008>.
- Ministère du Plan, 2020. Impacts sanitaires et socioéconomiques du COVID-19 en République Démocratique du Congo: Analyse prospective et orientations de la riposte multisectorielle. Technical Report. Gouvernement, Ministère du Plan de la RDC.
- Morsy, H., Balma, L., Mukasa, A.N., 2020. ‘Not a Good Time’: Economic Impact of COVID-19 in Africa. Working Paper Series 338. African Development Bank Group. URL: <http://www.afdb.org/fr/documents/working-paper-338-not-good-time-economic-impact-covid-19-africa>.
- Nonvide, G.M.A., 2020. Short-Term Impact of COVID-19 on Poverty in Africa. CEPR Press, Covid Economics: Vetted and Real-Time Papers 15, 184–195. URL: <http://cepr.org/sites/default/files/news/CovidEconomics15.pdf>.
- Pindyck, R.S., 2020. COVID-19 and the Welfare Effects of Reducing Contagion. NBER Working Paper 27121. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w27121>.
- UNCTAD, 2018. The Statistical Tables on the Least Developed Countries. Report. United Nations. URL: [http://unctad.org/en/PublicationsLibrary/ldcr2018stats\\_en.pdf](http://unctad.org/en/PublicationsLibrary/ldcr2018stats_en.pdf).

## **A Data**

### **A.1 Sources**

Our data are from three main sources: the National Institute of Statistics (INS) of the Democratic Republic of Congo (DRC), the DRC Ministry of Finance staff, and the Central Bank of Congo (BCC).

### **A.2 The consumer price index**

The consumer price index (CPI) is from the INS. It should be noted that in the DRC, there are several institutions which calculate the CPI including: the INS, the Institute for Economic and Social Research (IRES) and the Embassy of the United States Embassy in Kinshasa. However, only the CPI from the INS is considered official. The INS CPI has 12 components:

Table 5: Data, sources, frequency and period

Data	Source	Frequency	Period
Consumer Price Index (CPI) and its components	INS	Weekly	2012.01–2020.06
Public revenue	Ministry of Finance	Weekly	2019.01–2020.06
Public spending	Ministry of Finance	Weekly	2019.01–2020.06
Public deficit	Ministry of Finance	Weekly	2019.01–2020.06
Interbank exchange rate	BCC	Weekly	2019.01–2020.06
Parallel exchange rate	BCC	Weekly	2019.01–2020.06

*Component 1: Food and nonalcoholic beverages.*

1.1. Food products, 1.2. Breads and cereals, 1.3. Meats, 1.4. Fishes, 1.5. Milk, cheese and egg, 1.6. Oils and fats, 1.7. Fruits, 1.8. Vegetables other than potatoes and other tubers, 1.9. Potato, cassava, other tubers and bananas, 1.10. Sugar, 1.11. Jam, honey, chocolate paste and confectionery, 1.12. Salt, spices, sauces and food products, 1.13. Non-alcoholic drinks, 1.14. Coffee, cocoa tea and other plants for herbal teas, 1.15. Other non-alcoholic drinks.

*Component 2: Alcoholic beverages, tobacco and drugs.*

2.1. Alcoholic drinks, 2.2. Tobacco.

*Component 3: Clothes and shoes.*

3.1. Articles of clothing, 3.2. Shoes.

*Component 4: Accommodation, water, gas, electricity and other combustibles.*

4.1. Effective rents, 4.2. Maintenance and routine repairs of the dwelling, 4.3. Other housing-related services, 4.4. Electricity, gas and other fuels.

*Component 5: Furniture, household items and household maintenance.*

5.1. Furniture, furnishings and decoration, rugs and other coverings, 5.2. Household textile articles, 5.3. Heating and kitchen appliances, refrigerators, washing machines and others, 5.4. Glassware,

crockery and kitchen utensils<sup>3</sup>, 5.5. Tools for the home and the garden, 5.6. Goods and services for the routine maintenance of the dwelling.

*Component 6: Health.*

6.1. Medicines and other pharmaceutical products, therapeutic devices and materials, 6.2. Out-of-hospital medical and paramedical services, 6.3. Hospital services.

*Component 7: Transports.*

7.1. Vehicle purchases, 7.2. Use of personal vehicles, 7.3. Transport services.

*Component 8: Communications.*

8.1. Postal services, 8.2. Telephone and telegraph.

*Component 9: Entertainment and culture.*

9.1. Equipment and accessories including repairs, 9.2. Recreational and cultural services, 9.3. Newspapers, bookstores and stationery.

*Component 10: Teaching.*

10.1. Educational service, 10.2. School supplies.

*Component 11: Restaurants and hotels.*

11.1. Restaurants and drinking places, 11.2. Hosting services.

*Component 12: Other goods and services.*

12.1. Personal care, 12.2. Personal effects, 12.3. Other services.

In the DRC, the provinces are the first subdivisions of the republic. The DRC was successively divided into 6 provinces (between 1960 and 1966),<sup>13</sup> into 9 provinces (between 1966 and July 1988),<sup>14</sup> into 11 provinces (between 1988 and July 2015),<sup>15</sup> then into 26 provinces (since July 2015).<sup>16</sup> The capital, Kinshasa, is considered a city-province.

In practice, the INS continues to collect the prices of products for a household basket following

---

<sup>13</sup>Équateur, Kasai, Katanga, Kivu, Léopoldville, Orientale.

<sup>14</sup>Bandundu, Bas-Congo, Équateur, Kasai-Occidental, Kasai-Oriental, Katanga, Kinshasa, Kivu, Orientale.

<sup>15</sup>Bandundu, Bas-Congo, Équateur, Kasai-Occidental, Kasai-Oriental, Katanga, Kinshasa, Maniema, Nord-Kivu, Orientale, Sud-Kivu.

<sup>16</sup>Bas-Uele, Équateur, Haut-Katanga, Haut-Lomami, Haut-Uele, Ituri, Kasai, Kasai-Central, Kasai-Oriental, Kinshasa, Kongo-Central, Kwango, Kwilu, Lomami, Lualaba, Mai-Ndombe, Maniema, Mongala, Nord-Kivu, Nord-Ubangi, Sankuru, Sud-Kivu, Sud-Ubangi, Tanganyika, Tshopo, Tshuapa.

the former administrative areas of provinces, that is to say of the 11 provinces<sup>17</sup> The representativeness of the national sample is ensured by taking into account the structure of consumption expenditure of the 26 provinces in the weighting of the 11 sample provinces. Given the heterogeneity of products, the average price of products sold wholesale is evaluated by the geometric mean of the average weekly prices per point of sale.

### **A.3 Data on COVID-19**

Data on the evolution of COVID-19 in DRC are from the World Health Organization (WHO) database. Data include the number of cases of COVID-19 contamination, the number of deaths due to COVID-19 and the number of patients cured. The WHO is collaborating with the National Institute for Biomedical Research (INRB) headed by Professor Jean-Jacques Muyembe. Daily, this Committee publishes epidemiological bulletins to give the epidemiological situation of COVID-19 in the DRC. It is important to note that a first case of COVID-19 in the DRC was officially confirmed on March 10, 2020. As a result, by construction, the times serie takes values  $\geq 0$  before this date.

### **A.4 Data on public finances**

Data on public finances include government revenue, government expenditure and the government balance. Times series on public finances are in weekly frequencies and are from the DRC Ministry of Finance.

### **A.5 Data on the nominal exchange rate**

The last set of data used in this paper includes the interbank exchange rate and the parallel exchange rate. The nominal interbank exchange rate measures the parity between the Congolese franc and the US dollar. The Central Bank of Congo (BCC) regularly publishes data on the interbank exchange rate and the parallel exchange rate. In reference to [Kiguel and O’Connell \(1995, p. 22\)](#), the term parallel exchange rate refers to the financial rate in a dual system or to the black market rate in a black market system. Where a black market coexists with a dual system, one of the two parallel markets will typically be much larger, and the rate in this market is referred to as “the” parallel rate. The Congolese franc is the currency of the DRC. The Congolese franc, on the Congolese exchange market, is quoted uncertain.

---

<sup>17</sup>In Bandundu for Bandundu; Matadi for Bas-Congo; Mbandaka for Ecuador; Kananga for Kasai-Occidental; Mbuji-Mayi for Kasai-Oriental; Lubumbashi for Katanga; Kinshasa for Kinshasa; Kindu for Maniema; Goma for North Kivu; Kisangani for Orientale; Bukavu for Sud-Kivu.

# Figures

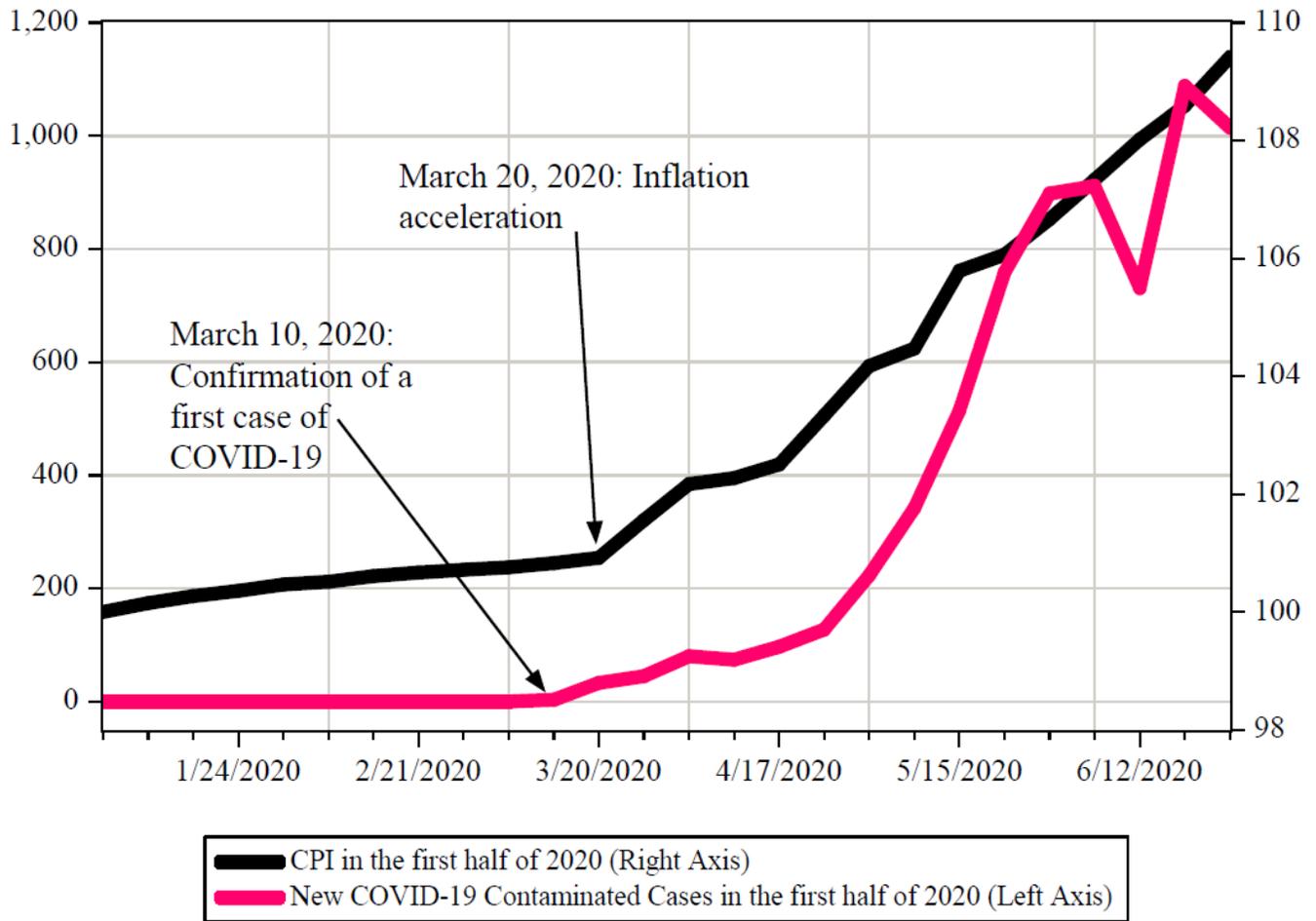
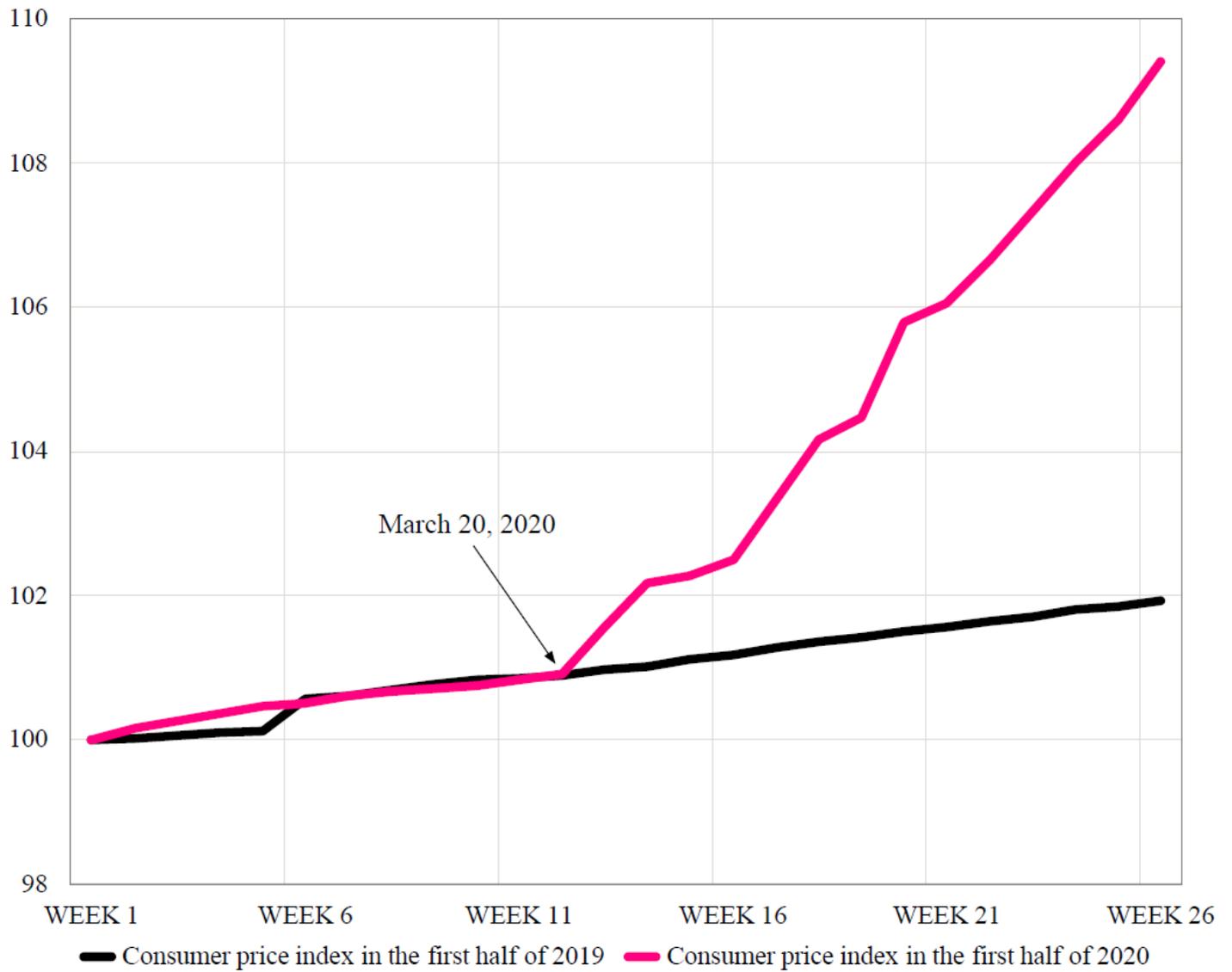


Figure 1

Consumer Price Index and New Covid-19 Contaminated Cases in the DRC. Period: January–June 2020.



**Figure 2**

Consumer Price Index in the first half of 2020 compared to the first half of 2019

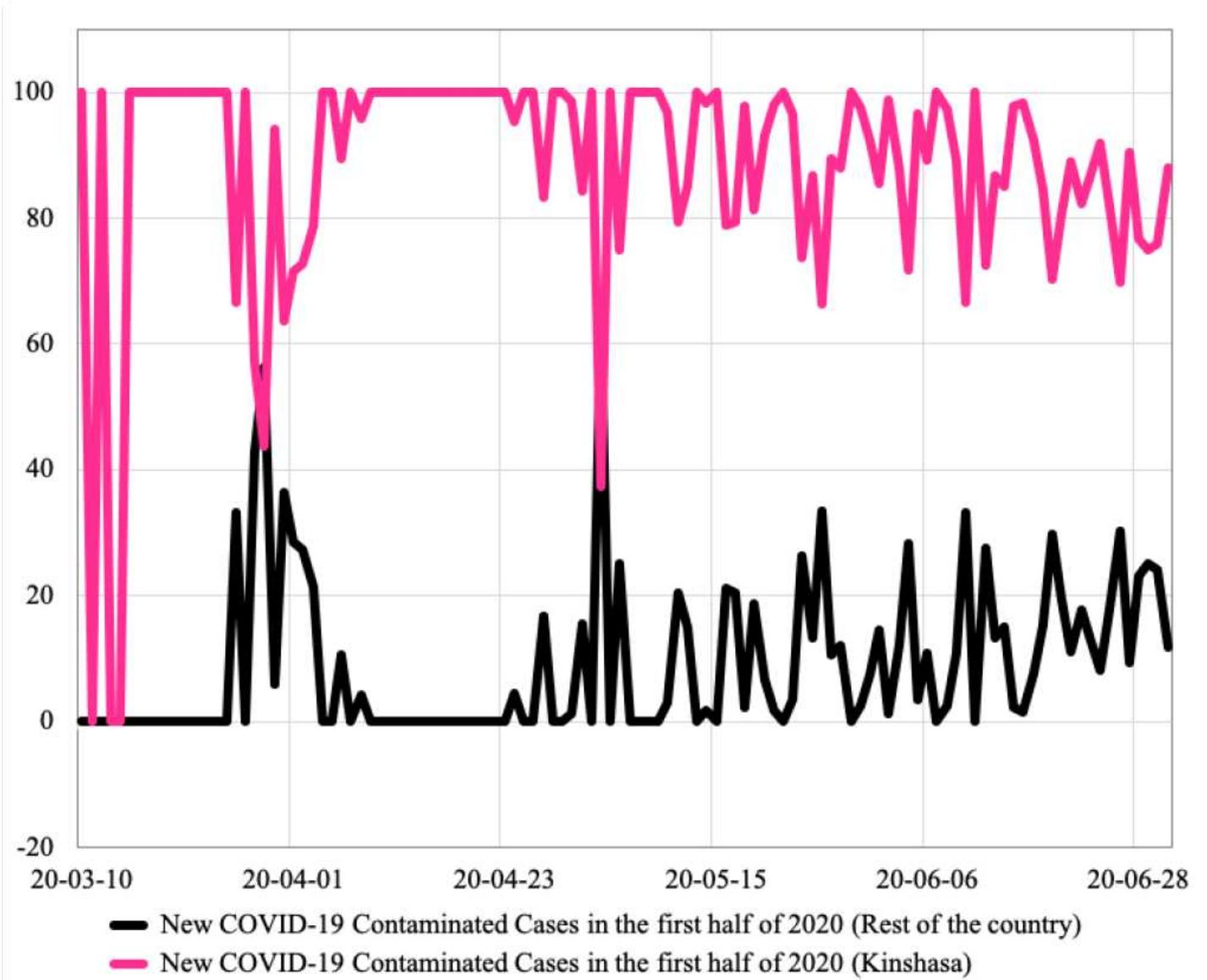
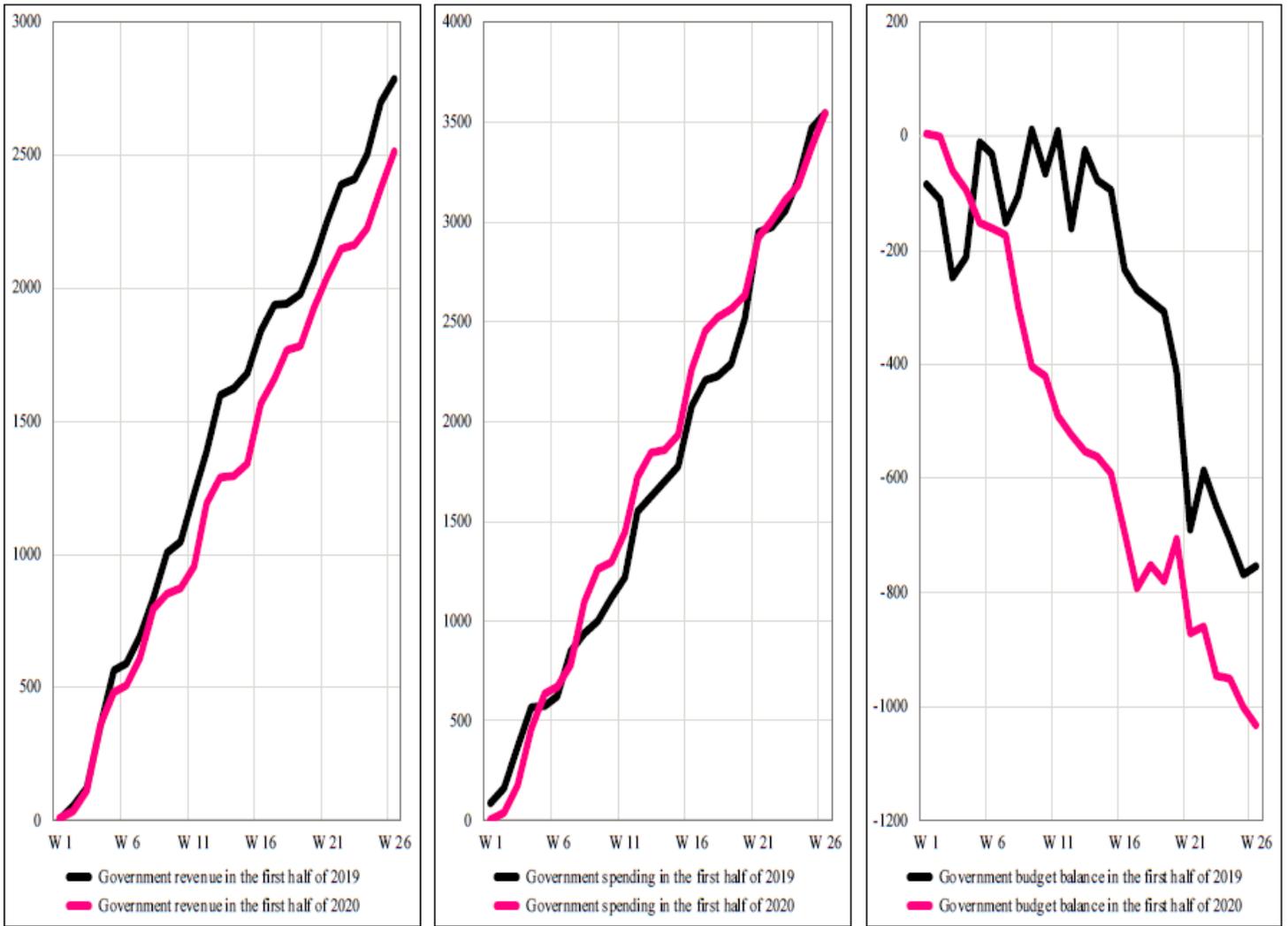


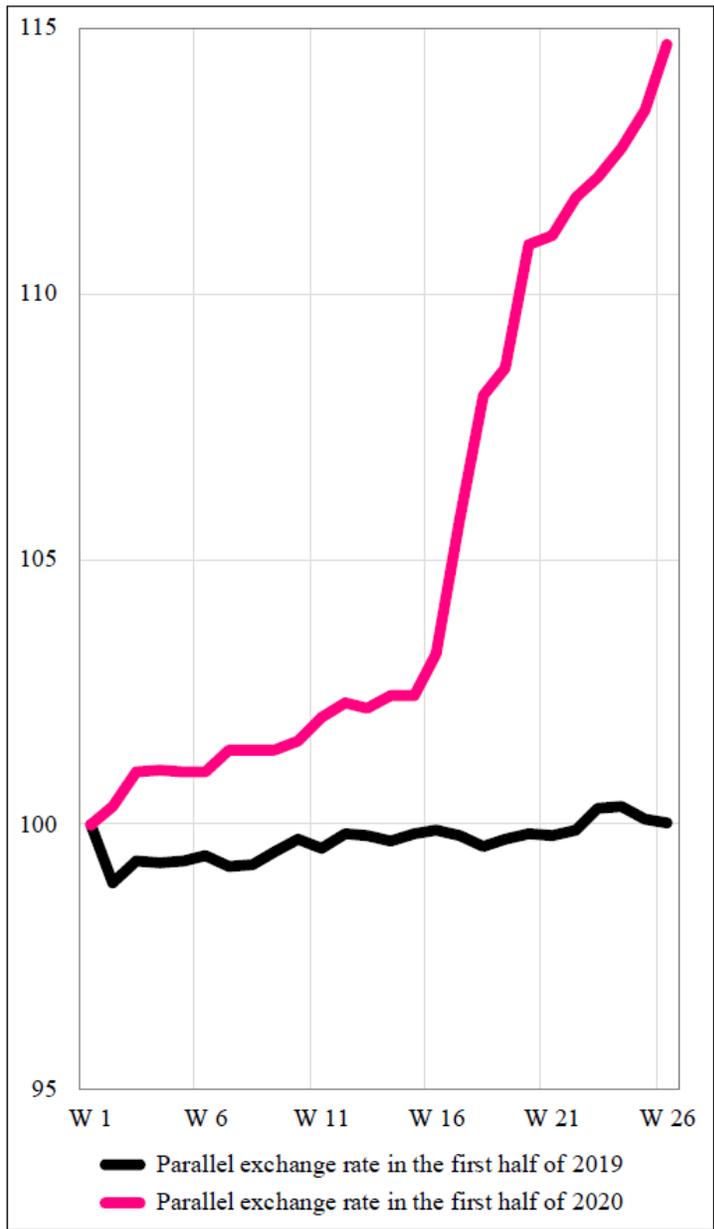
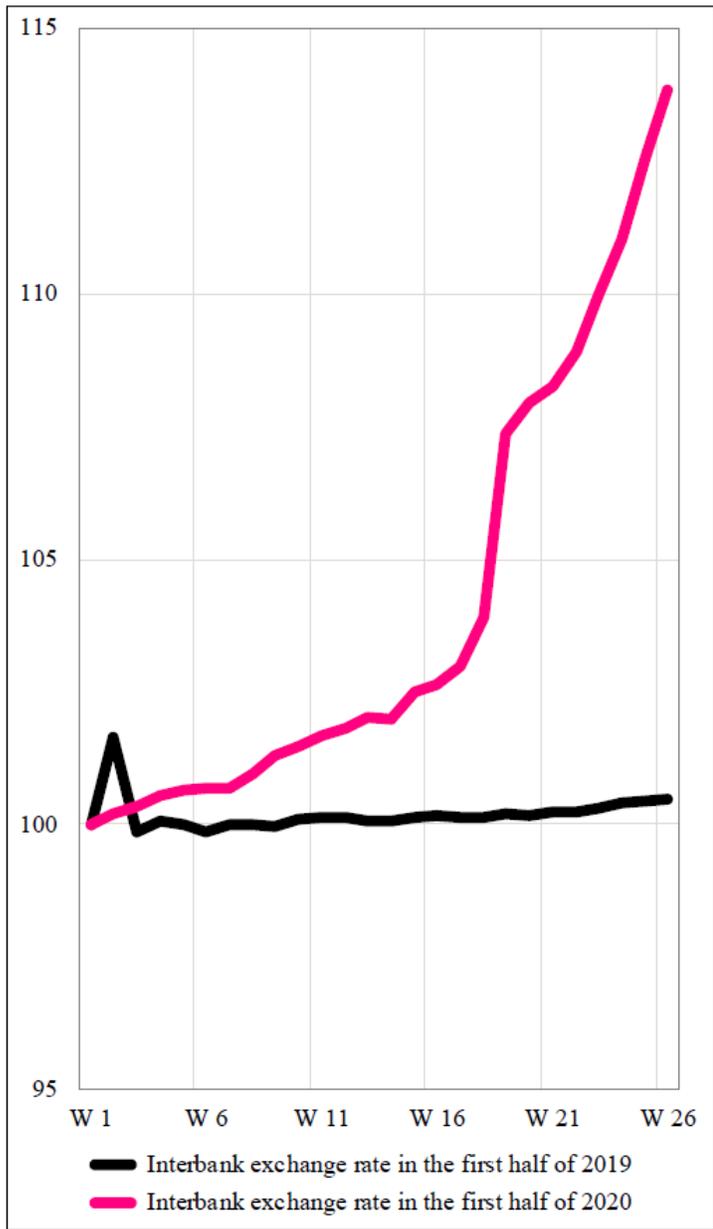
Figure 3

Share of people infected to Covid-19 during the first half of 2020



**Figure 4**

Government revenue, government spending, and government deficit in 2019-S1 et 2020-S2



**Figure 5**

Exchange rate in the first half of 2020 compared to the first half of 2019