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## The Italian economic stagnation in a Kaldorian theoretical perspective

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### Abstract

This paper analyses the Italian economic stagnation in a Kaldorian framework. On the theoretical ground we propose an interpretation of the Italian economic stagnation based on the continuous reduction of aggregate demand and labour productivity. We also consider the role of the banking sector as a factor driving aggregate demand and, in turn, labour productivity. We estimate a VAR for the period 2002–2015 to analyse jointly the evolution of private consumption, real GDP, private investments, credit supply, labour compensation and productivity. Our main empirical finding is that aggregate demand and credit supply significantly affect the path of labour productivity, consistently with Kaldor–Verdoorn Law.

### Introduction

The reduction of labour productivity has been considered one of the most important variables driving low growth and the massive increase of unemployment in Europe in the last Great Recession. Italy is one of the countries that has been suffering more from that vicious circle. The dominant view is that the Italian crisis ultimately depends on its high public debt. The argument is that high public debt has to be repaid via taxation, and that (current or expected) taxation reduces consumption and therefore domestic demand. Moreover, it is stressed that high public debt depends on high public expenditure and that this 'crowds out' private investment, with negative effects on economic growth (see Giavazzi and Pagano 1990, 1996; Alesina and Perotti 1995, 1997; Alesina and Ardagna 1998, 2010). Consequently, the suggested policy prescriptions consist of the reduction of public spending—insofar as this strategy is supposed to stimulate both private consumption and investment—and the implementation of "structural reforms", mainly via labour market deregulation. Moreover, it is also maintained that the Italian recession ultimately depends on 'institutional weakness', such as too much bureaucracy, corruption and low duration of governments (Macchiati 2016).<sup>1</sup>

This paper aims at providing a different interpretation of the Italian economic stagnation, based on a Kaldorian theoretical framework. In particular, it will be argued that the constant decline of aggregate demand and labour productivity, which started in the 1990s, can be interpreted as a vicious circle of cumulative causation involving perverse interactions between aggregate demand and aggregate supply. It is well known that Kaldor refers to the positive relation between output growth and labour productivity in the manufacturing industry, with causality running from the former to the latter,<sup>2</sup> due to the increase in firm size, the increase in worker specialization and the presence of increasing returns to scale.<sup>3</sup> In other words, he develops his theory of economic growth based on the 'accelerator' effect. Kaldor named this effect "the Verdoorn Law", in his Cambridge Inaugural Lecture in 1966. It is also known as the Kaldor–Verdoorn Law or Kaldor's Second Growth Law:

... the growth of real incomes was not determined by the growth of 'factor supplies' because, on account of increasing returns, higher rates of production growth were invariably associated with higher rates of growth of productivity" (Kaldor 1989, p. 87).

And:

“the growth of productivity will be greater the more technological change is ‘activated’ through new investment” (Kaldor 1989, p. 28).

The last quote represents what the author calls the “technical production function”. The revised version of Kaldor’s Second Law proposed here (and tested in Sect. 4) is based on the role of the credit channel in affecting the relationship between aggregate demand and labour productivity. Two factors motivate the choice of considering the role of banking policy in exploring the nexus between the path of aggregate demand and that of labour productivity. First, on the empirical ground, bank credit is the most important source of financing for most Italian firms. This, in turn, depends on the fact that the Italian production system is mainly populated by small firms, which operate in ‘mature’ productive sectors 4 and are more dependent on bank credit than big companies.

Second, on the theoretical side, it is argued that a reduction in credit supply limits the possibility of investing for firms that will react by cutting labour demand. As a result, the increase of unemployment reduces wages and, for a given propensity to consume, also private consumption. Moreover, a reduction of credit supply contributes to reduce aggregate demand via the reduction of private investments, which, in turn, generates a drop in labour productivity.

We provide evidence of a decline of aggregate demand spilling over into labour productivity. In the first part of our analysis we provide a reconstruction of the first phase of the Italian stagnation started in the early 1990s; in the second part we investigate empirically, for the period 2002–2015, the Kaldor–Verdoorn law—also labelled Kaldor’s second Law. 5

We contribute to the literature by enriching the Kaldorian framework with credit supply. There are two main reasons that spur us to use an augmented version of Kaldor’s second Law. First, Kaldor supported an endogenous money view and, although he did not explicitly address this topic in formulating this Law, it seems legitimate to consider the role of the banking sector in affecting the path of labour productivity, thus unifying two fundamental aspects of Kaldor’s work. Second, the augmented second Kaldor Law appears very useful for interpreting the Italian economic stagnation, insofar as the Italian economy is populated by small firms with low internal funds, dependent on the banking sector for financing their investments. The joint contribution of credit supply, labour productivity, consumption and investment is assessed empirically using the vector autoregression (VAR) methodology. The analysis covers the period starting from the euro changeover, while, in the specification including credit supply, the estimation starts from 2003, in order to use the bank lending survey, which started to be released in that year.

Our empirical analysis shows that higher output, investment and/or private consumption increase labour productivity. In a richer model with credit supply, we confirm the latter evidence and we highlight the role played by credit supply in the transmission of shocks from demand to labour productivity. We do not claim to have established a clear-cut one-dimensional direction of causality since the VAR evidence confirms that the transmission channel also works from labour productivity to demand. Our results show that a Kaldorian interpretation of the relationship between aggregate demand and labour productivity is equally plausible.

The exposition is organized as follows. Section 2 provides a reconstruction of the key factors behind the Italian economic stagnation. Section 3 focuses on Kaldor’s Second Law, providing a revision of its standard formulation, where credit supply plays a crucial role in affecting the path of labour productivity. Section 4 estimates the model using VAR models, Sect. 5 concludes and, finally, an appendix reports some diagnostic tests.

At the origins of the Italian economic stagnation: the 1990s

Evidence shows that among advanced economies, Italy is undoubtedly one of the worst performers in the last two decades. For the last two decades the performance of the Italian economy has been viewed with pessimism: low growth, insufficient investments and demand, inadequate technical training, and inept management have been familiar features of the debate for this whole period. In

the three decades from 1961 to 1990, Italian economic growth outperformed the three largest world economies. However, since the early 1990s, the performance has changed drastically: the real GDP per capita growth slowed down initially, and then started decreasing. 6 The 1970s marked a significant reduction in Italian economic growth, which stopped the so-called Italian economic miracle—i.e. high rates of growth driven by increasing export. The relevant increase of workers' bargaining power—and hence of wages—combined with the extraordinary increase of oil price also contributed to generate impressive inflationary pressures. The combination of wage increases and imported inflation made it even more difficult for the Italian firms to continue exporting via price competition. The mechanism at the basis of the high rates of growth of the 1960s stopped.

Italian firms reacted via the decentralization of production, in order to prevent social conflict (Graziani 2000; Moro 2015). This gave rise to the birth of small firms, which, starting from that period, marked the most relevant specificity of the Italian capitalism: i.e. the average small size of firms. This specificity is relevant in order to consider firms-banks relationships: small firms are more exposed to credit crunch, while large firms are more successful in avoiding major losses of productive capacity in a phase of crisis (Locatelli et al. 2016).

The Lira devaluation of 1992 revealed Italy's structural weakness, increasing scepticism on the possibility of Italian adhesion to European Monetary Union. In the same years, Italian banking system was deeply reformed. With the Consolidated Law on Banking in 1993 and the Reform on Finance in 1994, we arrived at liberalization of branching, significant relaxation of entry barriers, privatization, massive process of mergers, concentrations and acquisitions. These changes produced substantial effects on the non-financial economy, and in particular on small and medium-sized firms and on regional distribution of resources (Agostino et al. 2004).

The key factor in Italian stagnation is the poor performance of labour productivity in the last two decades. The high productivity observed between 1970 and 1980 is mainly due to the predominance of big firms operating in the manufacturing sector (as shown by Fuà 1976, 1977; Graziani 2000 and, more recently, Lucidi and Kleinknecht 2010). In recent decades, the average firm size has further declined: in 2008 the average number of workers in Italian firms was half the average of the five leading EU countries (Toniolo 2013). This downsizing of large firms has caused a reduction of investment in research, making the Italian industrial structure vulnerable in terms of technological innovations (Toniolo 2013; Lucarelli and Romano 2015).

Following Graziani (2000), the implementation of restrictive fiscal policies at the beginning of the 1990s has exacerbated the structural crisis of the Italian economy. Two factors motivated this choice: (1) the attempt to reduce the high public debt/GDP ratio in order to respect the Maastricht treaty, (2) the idea that public spending was almost entirely wasteful. 7 As will be shown in the next section, the reduction of public spending combined with increased taxation (especially on low-income households) generated a decline of aggregate demand, due to the standard Keynesian mechanism, but also a drop of the labour productivity growth, due to the operation of Kaldor's Second Law.

#### Kaldor's Second Law and the Italian economic stagnation

This section is devoted to rationalizing the idea that the Italian economic stagnation basically depends on the interaction between fall of aggregate demand followed by reduction of aggregate supply and growth of labour productivity. We will use (and test in the next section) a revised version of Kaldor's Second Law.

Evidence shows that, starting from the 1990s, Italy has been experiencing a constant decline of aggregate demand and a continuous drop in labour productivity. The restrictive fiscal policies implemented to reduce public debt reduce aggregate demand. With respect to labour productivity, OECD (2015) reports that the growth rate of labour productivity in Italy in the period 2001–2010 is about 0%, while, on average, EU27 countries experienced a growth rate of about 2% in the same period. Moreover, starting from the first half of the 1990s, Italy was one of the OECD countries where privatizations of public firms were more intense. The "Privatization Barometer" certifies that

the number of privatizations implemented from 1992 to 2007 is 144, and that only Japan did more. Insofar as privatization was not associated to liberalizations, they also contributed to the decline of aggregate demand, via the increase of prices in those sectors and the consequent decline of real wages and consumption. 8

Relying on the presumed idea that “small is beautiful”, during the 1980s, Italy did not implement industrial policies, reducing public spending with the aim of reducing public debt and systematic deficits in the trade balance. The significant cut of spending in R&D—both on the part of the State and of private firms—leads to the increasing dependence of the Italian economy to the import of high tech capital goods, thus intensifying the specialization in the production of low-tech goods (Lucarelli and Romano 2015).

The outcome of these decisions has been twofold, and counterproductive for economic growth. First of all, cutting public spending (and raising taxes) has not been a successful strategy in reducing the ratio of public debt/GDP, which has kept growing. Secondly, the drop in internal demand has reduced firms’ profits, leading to further shrinkage in their average size and to a drop of investment. This, in turn, has been followed by increased unemployment—especially among the young and the highly educated individuals 9—reduction of profit margins and/or bankruptcies, lower investments and consequently a lower rate of growth in labour productivity. Moreover, the decline of aggregate demand reduced firms’ solvency and, as a result, made it less convenient for the banking sector to accommodate firms’ demand for credit (Forges Davanzati 2016).

Importantly, policies of labour market deregulation, introduced by what is called Treu’s Act in 1997 (and subsequently by Biagi’s Act in 2003), contributed to accelerate these dynamics, negatively affecting wages and private consumption. OECD (2015) reports that, in Italy, the Employment protection legislation index fell from 3.57 at the beginning of the mid-1990s to about 1.5 in 2014 and that the labour share significantly declined in that period.

More specifically, labour market deregulation reduces workers’ bargaining power and, as a consequence, wages and consumption. This effect is reinforced by the fact that workers’ propensity to consume is likely to depend on the degree of labour market deregulation. The rationale for this is based on the assumption that (1) workers aim at maintaining their consumption constant over time; (2) flexible labour contracts are expected to increase workers’ effort (the so-called discipline effect); (3) flexible labour contracts increase workers’ uncertainty. 10 As a result, two conflicting effects are present. On the microeconomic level, firms find it profitable to hire with flexible labour contracts, insofar as, due to the ‘discipline effect’, they expect that workers will increase their effort, with the consequent increase in labour productivity and profits. By contrast, from the macroeconomic point of view, flexible labour contracts, insofar as they increase workers’ uncertainty, push workers to increase their precautionary savings. Labour market deregulation allows firms to compete via wage cutting and, thus, discourages innovation. To that extent, the drop of consumption and innovation contribute to the reduction of both aggregate demand and the growth of labour productivity. 11

Moreover, one can argue that the decline of labour demand for high-skilled workers, induced by the reduction of public and private investments, combined with labour precariousness, is a relevant factor triggering migrations of high-skilled workers. The constant reduction of the growth rate in labour productivity can be also explained considering the simultaneous presence of these conditions, which, as suggested by empirical evidence, are more intense in Southern Italy (SVIMEZ 2016).

Accordingly, the so-called Italian economic decline can be imputed to the constant reduction of aggregate demand and the consequent reduction of labour productivity, amplified by credit restriction. In the next section we will evaluate these issues on the empirical ground.

Estimation strategy and main results

In this section we assess the relationship between aggregate demand and labour productivity. Among the components of aggregate demand, we investigate the way private investment and

consumption contribute to labour productivity. Moreover, we will also evaluate the transmission mechanism from the credit channel to investment and labour productivity.

The main issue in analysing the Kaldor's law lies in the assumption of the GDP exogeneity and consequently in its effects on labour productivity. The idea is that higher GDP determines an increase of labour productivity. The methodology followed by post-Keynesian economists—such as Millemaci and Ofria (2014)—consists of reduced-form regressions where GDP is exogenous to labour productivity. <sup>12</sup> This assumption is very strong, because it is difficult to rule out the transmission mechanism going in the other direction: while economic growth determines higher labour productivity, it is equally likely that higher labour productivity spurs economic growth. In order to overcome the endogeneity issue, we apply a reduced-form VAR model, which is appropriate for an analysis of the relationships between labour productivity and demand components without making a priori assumptions on their structure. Since in a VAR model all variables are jointly determined without any a priori assumption about causality, we believe that this estimation strategy allows us to test whether the causal relationship assumed in other approaches is valid or whether there are feedback effects from aggregate demand components to productivity. Furthermore, the VAR approach allows testing for indirect effects between the variables of the model.

We use quarterly data, taken from the ECB's Statistical Data Warehouse, for the period going from the first quarter of 2002 to the third quarter of 2015. All variables are in log-levels <sup>13</sup> and we take out the trend to variables using the Hodrick–Prescott filter. <sup>14</sup>

Therefore, our VAR specification will be structured in the following way:

$$X_t = c + \sum_{j=1}^k \beta_j X_{t-j} + \varepsilon_t, X_t = c + \sum_{j=1}^k \beta_j X_{t-j} + \varepsilon_t,$$

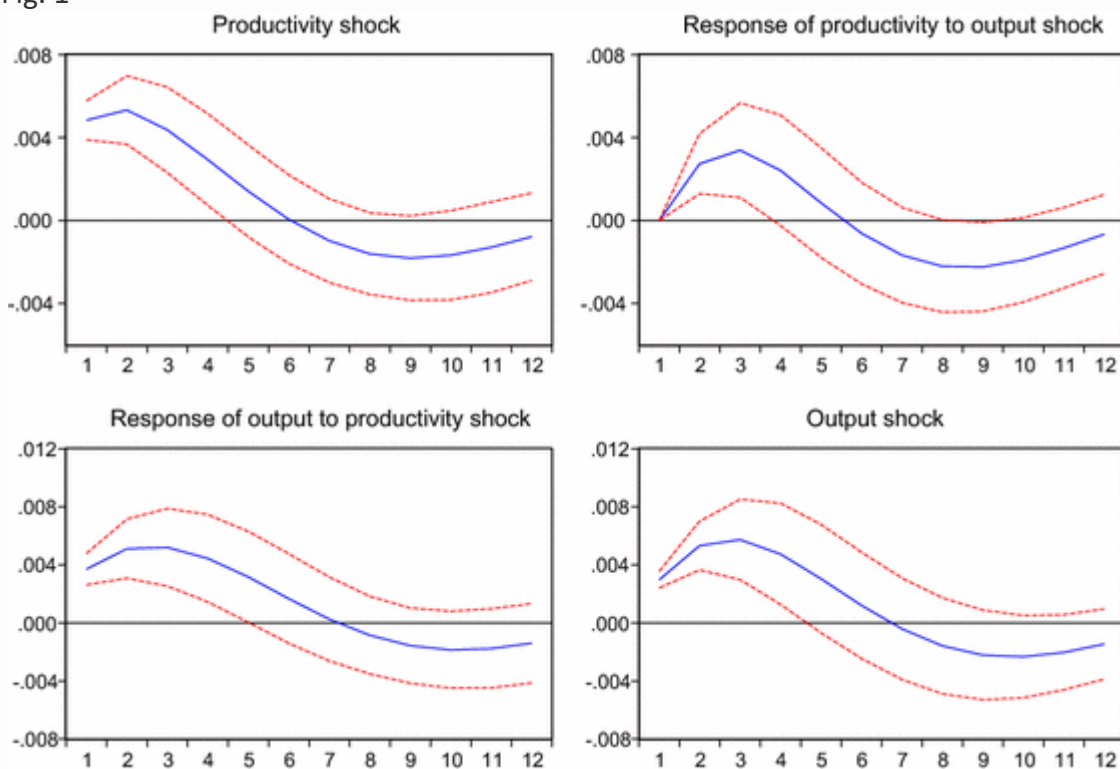
where  $c$  is a vector of constants,  $X_t$  is a vector of endogenous variables,  $\beta$  is a squared matrix of slope coefficients that are to be estimated for each lag distance  $k$ , and  $\varepsilon$  is a vector of disturbances. We decided to avoid explicit cointegration analysis in the present paper for three reasons. First, our sample includes about fifty observations for the VARs estimated and it spans 14 years, so that our study is dedicated to the short-run relationships between labour productivity and the aggregate demand. Second, one of the variables that we are including in our empirical exercise is a proxy for credit supply, which is available only since 2003. Since the inclusion of credit supply in the theoretical model is one of our contributions to this literature, we preferred just to conduct a short-run analysis to assess the role played by credit supply. Finally, our choice is in line with much of the literature on the empirical approach to modelling the effects of unexpected policy shocks, such as Peersman and Smets (2003), Bonci (2011) and Giannone et al. (2012) for the euro area. <sup>15</sup> Notice that, as underlined by Sims et al. (1990), standard asymptotic tests are still valid if the VAR is estimated in levels, even in the case in which the variables are cointegrated.

The first VAR that we analyse is a two-variable VAR with labour productivity and real GDP. With respect to labour productivity, we consider labour productivity per hour worked. It is computed according to the European System of Accounts (ESA 2010) <sup>16</sup> and is calculated as real output per unit of labour input (measured by the total number of hours worked). We chose this measure of labour productivity because it provides a better picture of productivity developments in the economy than labour productivity per person employed, as it eliminates differences in the full time/part time composition of the labour force. As for the lag length, standard analysis and tests suggest the use of two lags (see Table 1 in Appendix). In Table 2 we show that, despite the small number of lags and the small sample size, fitted residuals show no sign of autocorrelation. In Table 3 we report Jacque–Bera test results, according to which the hypothesis of normality is also not rejected, both at the individual series level and jointly, at the 95% confidence. <sup>17</sup>

Figure 1 shows the effects of an unexpected one standard deviation increase in each of the endogenous variables on the others. Each column presents the dynamics after each shock: the first

column considers the effect of a shock in labour productivity, while the second column presents the results of an unexpected increase in output. The graph shows that the transmission mechanism goes in both directions, with an increase in output inducing higher productivity and vice versa. Therefore, the Kaldorian channel appears to be at least as plausible as the traditional one. 18 Both shocks appear to be significant for about six quarters; labour productivity jumps significantly and exhibits the same hump-shaped reaction of real output, consistently with Verdoorn's specification that labour productivity is increasing in output. While the previous relationship is usually considered to hold in the long run, here we find that it holds in a shorter time period. We interpret this result in favour of a cyclical response of labour productivity to output: policies that stimulate output will also spur labour productivity and, in turn, economic growth, creating a virtuous circle.

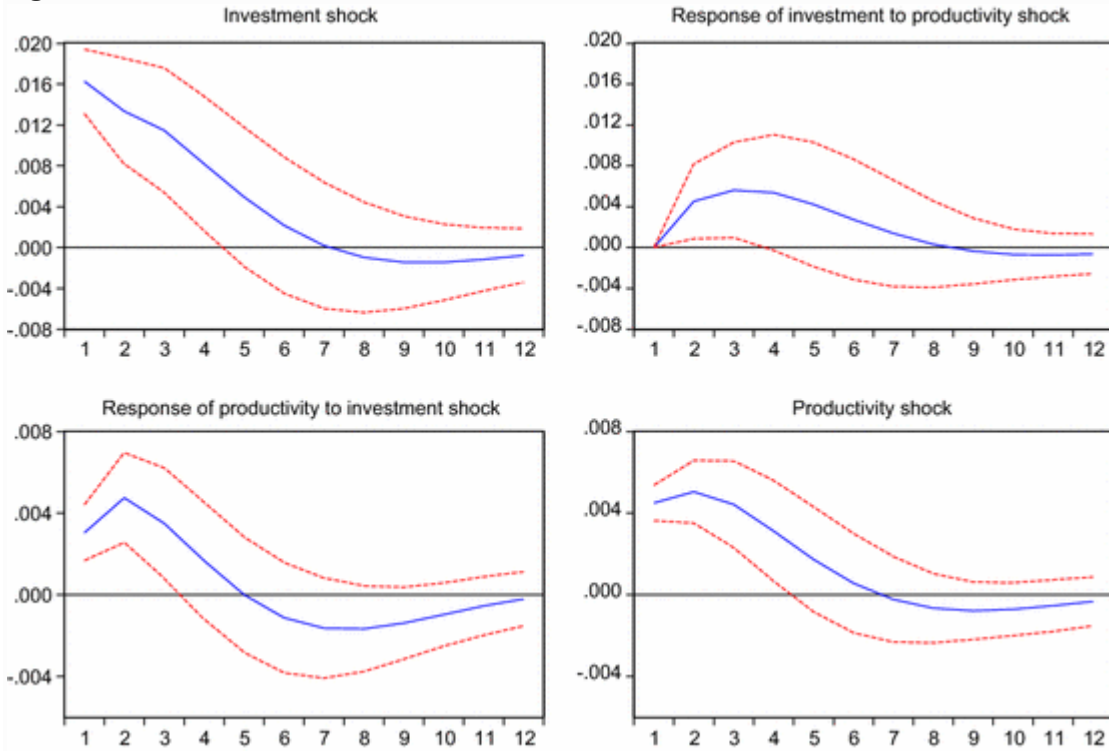
Fig. 1



Impulse response functions in a VAR with real GDP and labour productivity

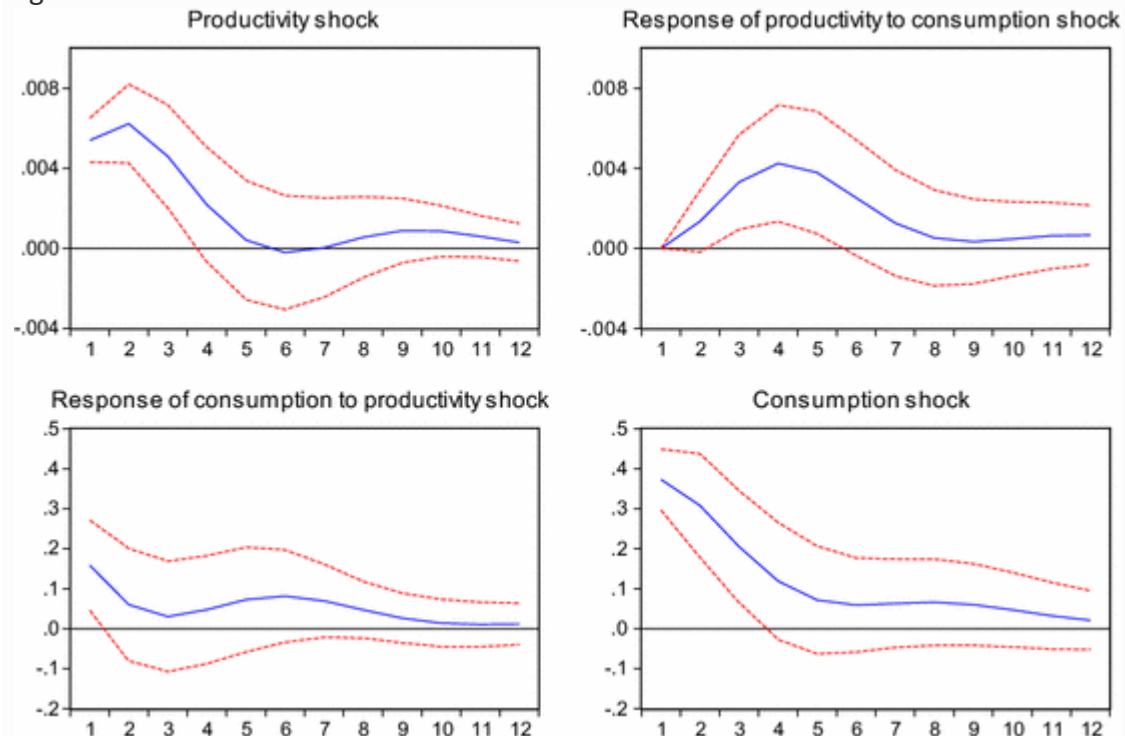
As argued in the previous section, two demand components are crucial in explaining labour productivity: investment and consumption. Figures 2 and 3 present the impulse response functions for a VAR with labour productivity and private investment and labour productivity and private consumption as endogenous variables respectively. These graphs confirm that the transmission of the shocks work in both directions: after a positive shock in private investment, labour productivity jumps significantly for five quarters, while a shock to labour productivity determines a significant increase in investment for about three quarters. As to the results for a VAR including consumption and productivity, Fig. 3 shows that labour productivity responds significantly and in the expected direction: an increase in private consumption—typically driven by higher wages—incentives labour productivity. More specifically, labour productivity keeps growing even after the consumption shock has lost its statistical significance, showing that the transmission to productivity is persistent. On the other hand, we find that consumption rises only for one quarter after a productivity shock before following a flat path that is not statistically significant. This graph confirms explicitly how the Kaldorian transmission mechanism should at least be taken into account in explaining the relationship between demand and labour productivity.

Fig. 2



Impulse response functions in a VAR with private investment and labour productivity

Fig. 3



Impulse response functions in a VAR with private consumption and labour productivity

The previous analysis confirms that a VAR analysis, without imposing any structural relationships, cannot discard the shock transmission in both directions, from demand to productivity and vice versa. In the rest of our empirical analysis, we try to find evidence of Kaldor's second law in the Italian economy considering a richer model, where credit and wages play a significant role. As explained in Sect. 3, we interpret Kaldor's second law in terms of wages and bank credit: higher wages bolster private consumption, while an increase in credit supply determines an increase in

firms' investments. Both effects concur to raise labour productivity. We use the bank lending survey (BLS) as a proxy for the credit supply in Italy. This survey was launched in 2003 for the euro area with the objective of enhancing the Eurosystem's knowledge of financing conditions in the euro area. The survey is designed to collect information on supply and demand conditions in the euro area credit markets and on the lending policies of euro area banks. This analysis is conducted by interviewing senior loan officers of a representative sample of euro area banks four times a year. The sample group participating in the survey comprises around 140 banks from all euro area countries and takes into account the characteristics of their respective national banking structures. We will consider the first question of the questionnaire, which asks, in net percentage over the past 3 months, if the banks have tightened or eased the conditions at which they approve loans and credit lines to enterprises. <sup>19</sup> The net percentage is given by the difference between the percentage of answers indicating the variation with a particular sign—such as “strengthening” of conditions—and the percentage of the answers with opposite sign such as “easing” of conditions. The index varies in the  $[-100, 100]$  interval. The answer to this question can be “tightened considerably”, “tightened somewhat”, “remain basically unchanged”, “eased somewhat” and “eased considerably” and it is possible to distinguish along the firm size and loan duration.

We perform a VAR analysis in credit supply, wages, private consumption and labour productivity. Also in this case the VAR model allows us to treat the variables involved in the most suitable way without making any assumption about the transmission of shocks. For example, while Kaldor's law postulates that higher wages (via high consumption and aggregate demand) determine higher labour productivity, it can be also the case that when labour productivity is higher, firms innovate more, generate revenues and are willing to pay higher wages. Similarly, high wages stimulate aggregate demand, investments and bank loans, but another plausible transmission channel goes through the banks' selection of more productive and innovative firms. Moreover, variations of credit supply affect the path of consumption both directly, via private indebtedness, and indirectly, via its effect on investment, employment and wages.

We present the results from the impulse response analysis in Fig. 4. In the first panel we show that when banks tighten the conditions at which they approve credit lines (our proxy for lower credit supply), labour productivity declines significantly and persistently (about 7 quarters). This can be interpreted using Kaldor's second law: when banks reduce loans, there is a negative effect on private investment, consumption and, in turn, a reduction in labour productivity. The second panel shows the effects of a consumption shock, with a significant effect on labour productivity, as already highlighted in Fig. 3. In the third panel we present the effects of an unanticipated shock in wages. This shock appears transitory, since wages go back to their steady-state level in two quarters. Labour productivity increases significantly for about the same number of quarters during which the shock is well above its steady state value in a statistically significant way. Consumption does not react significantly, probably reflecting the very temporary increase in wages, while credit supply to firms does not respond significantly. Finally, the fourth panel presents the effects of a positive productivity shock. We show that wages rise significantly for two quarters, so that the positive relationship between productivity and wages works also in the transmission from the former to the latter. Credit supply decreases, even if this result is statistically significant between the third and fifth quarter after the productivity shock hits the economy.

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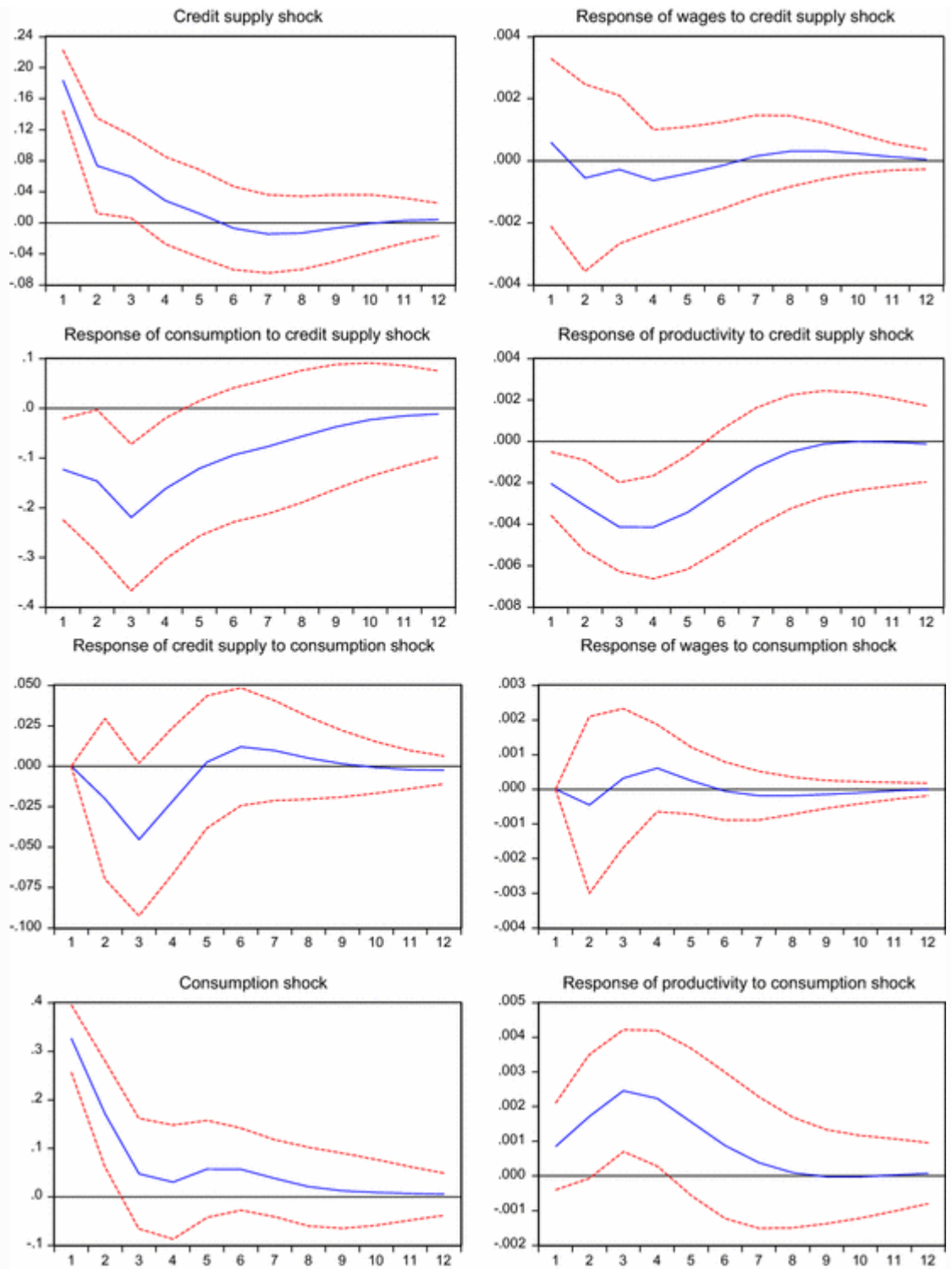
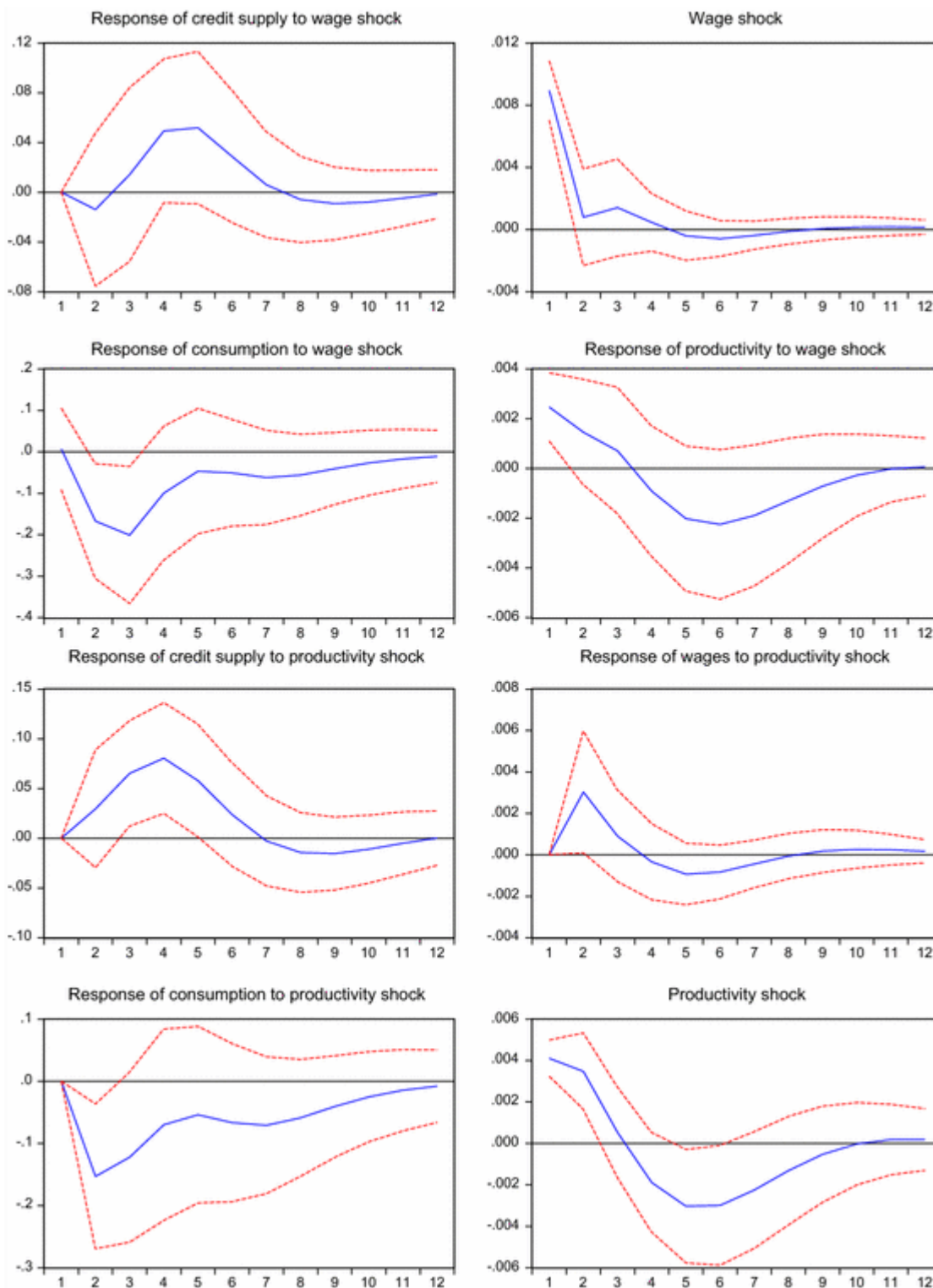


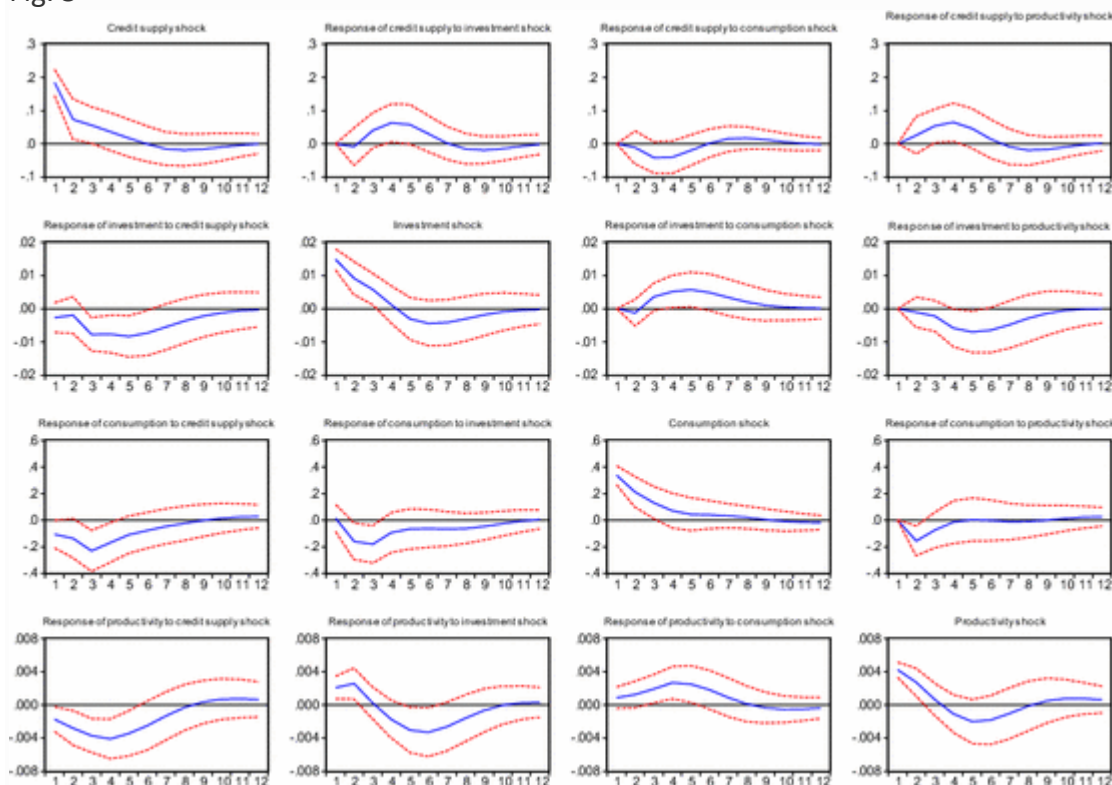
Fig. 4



Impulse response functions in a VAR with credit standards, wages, private consumption and labour productivity

The evidence just presented holds similarly in a VAR with private sector investment instead of wages. As documented in Fig. 5, which shows the impulse responses of this VAR, we find that investments diminish after a restriction in credit supply, as expected. Hence, the reduction in consumption can be fuelled directly or indirectly, through lower investment and hired workers. Our analysis can be seen as evidence of an extension of the traditional credit view in the monetary policy transmission. While the standard credit view emphasizes the role played by credit because of its imperfect substitutability and because of the information asymmetries in financial markets, we show that credit is relevant also in the evolution of labour productivity. A credit tightening, through its negative effect on labour productivity, reinforces its contractionary effect on the economy.

Fig. 5

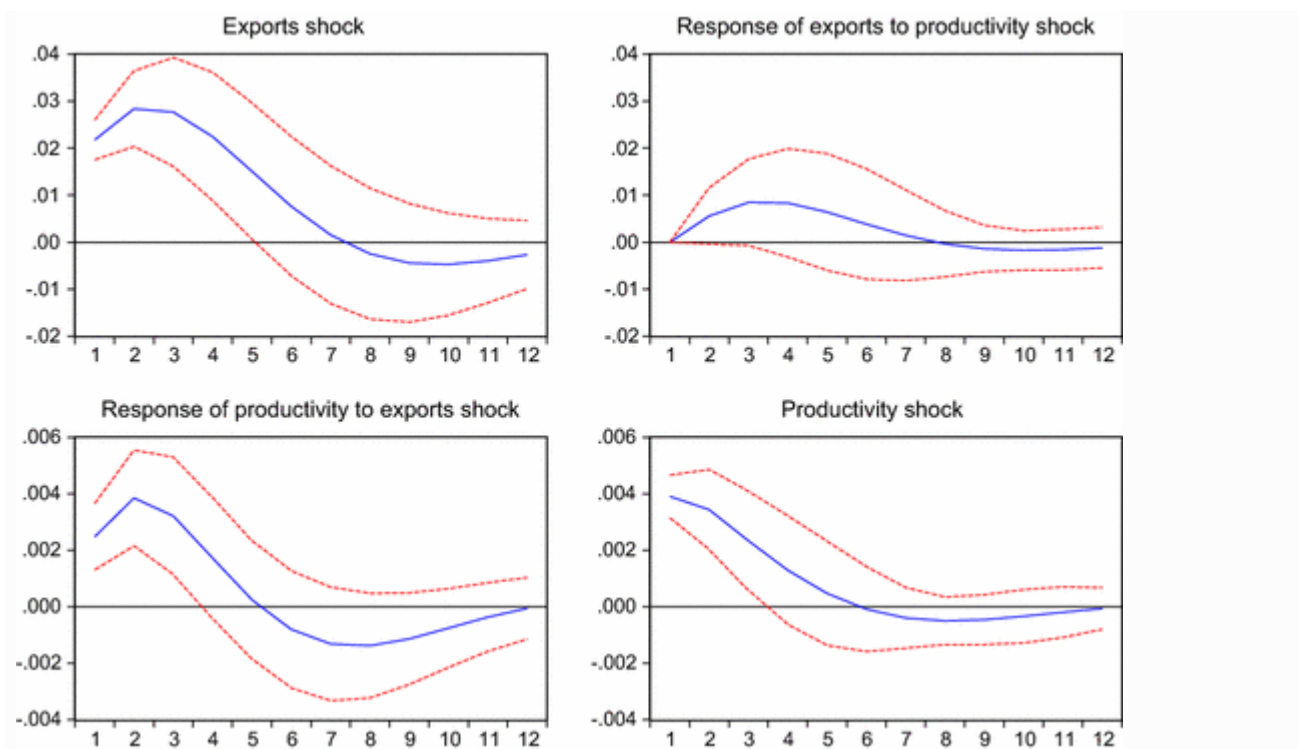


Impulse response functions in a VAR with credit standards, investment, private consumption and labour productivity

As last exercise, we consider if our results are robust with respect to our assumption of having a closed economy model. The extension to an open-economy setup poses some issues. It is widely believed that higher labour productivity should lead to decreasing costs, reducing prices and increase of net exports. This view is based on the assumption that Italian exports are driven by wage moderation and price-competitiveness (Blanchard and Giavazzi 2003). At the same time, it is argued that the decline of internal demand, consequent to the reduction of public spending, should reduce import via the reduction of private consumption. However, for Italy both these effects do not appear to fully work because Italian exports are mainly driven by non-price competitiveness: goods produced in the agribusiness sector are exported mainly via their quality; luxury goods are exported under the operation of the “Veblen effect”, also labelled “Made in Italy” effect. 20 Evidence suggests that both price and income elasticity of Italian exports are relatively low (Fettingh and Federico 2011). The collapse of Italian exports in the period under consideration—with particular reference—to the period starting from 2008–2009 appears to confirm the view that austerity policies combined with labour market deregulation did not generate an export-growth path. 21

These preliminary considerations suggest that the analysis of an open economy setup would require studying a completely different theoretical model. As a consequence, at this stage we limit to estimate a bivariate VAR consisting of net exports and labour productivity, 22 showing in Fig. 6 the impulse response functions. We can see that, similarly to what shown before in closed economy, the interrelation between labour productivity and net exports can be interpreted is a “Kaldorian” way: an unexpected increase in net exports spurs labour productivity and its statistical significance lasts four quarters, while an unexpected increase in labour productivity induces a lower response of net exports.

Fig. 6



Impulse response functions in a VAR with net exports and labour productivity

### Concluding remarks

This paper deals with the Italian economic stagnation in a Kaldorian theoretical framework. On the theoretical ground, the interpretation of the Italian economic stagnation proposed is based on the continuous decline of domestic demand and the constant reduction of labour productivity, starting from the beginning of the 1990s. These stylized facts have been interpreted using a Kaldorian framework, with private consumption and investment moving in lockstep with labour productivity. While the previous literature on economic stagnation tends to focus on a specific dimension—labour productivity in the traditional scheme and aggregate demand in a post-Keynesian framework—the empirical approach taken here provides a multi-dimensional view, based on a joint analysis of labour productivity, real GDP, both in aggregate terms and considering private consumption and investments, wages and credit supply. The main objective of our analysis is to focus on the interactions among these variables after the euro changeover in 2002. Using an unrestricted reduced-form VAR, we provide evidence that labour productivity grows after an increase in investments and private consumption. We also add credit supply to our analysis, showing that it plays a crucial role in affecting aggregate demand and, in turn, labour productivity. Specifically, we document that when banks tighten the conditions at which they lend, firms will decrease investments and households will reduce their consumption path. Both effects concur to a reduction to labour productivity.

Our results point out that there exists a less conventional channel that is consistent with Italian economic stagnation. While, according to the dominant view, the Italian stagnation was fuelled by the high debt level, which induced the government to increase taxation in a detrimental way for labour productivity and aggregate demand, our VAR exercises show that the transmission can go also from aggregate demand to productivity (and growth), in a Kaldorian framework. Our results are apparently in contrast with some influential theories of economic expansion and recession. First, neoclassical and real business cycle models generally conclude that economic recession is mainly driven by negative technology shocks. Even if our exercise does not exclude this channel, we show that a lower productivity is the result of a contraction in aggregate demand. Second, and related to

that, a fiscal stimulus that boosts aggregate demand can potentially increase labour productivity. We believe that this result can be useful as a policy prescription in the present Italian context characterized by stagnating productivity and demand which contribute in failing to reduce the public debt-to-GDP ratio. Our results cast doubt on the effectiveness of the so called “austerity” to decrease indebtedness and on the need of contracting public spending in order to eventually diminish taxation and stimulate private investments.

A novelty of our analysis is the role played by credit supply in second Kaldor’s law. We show that a contraction in credit supply operates primarily by contracting local demand and reducing labour productivity. Since small firms are predominant in the Italian productive system and usually establish credit relationships with local banks, having disaggregated micro data about local banks could help us in identifying the crucial role played by banks in the Italian productive system. 23 Finally, our paper considers a closed economy setup. It would be interesting to extend our analysis to an open-economy setup, highlighting the interrelationship between labour productivity, credit supply, the real exchange rate and the net exports. We leave these issues for future research.

## Notes

1. Moreover, according to the International Monetary Fund (IMF Country Report: Italy, 2016, p. 4): “Structural rigidities—not least product and services market inefficiency, wage growth in excess of productivity, high taxation, an inefficient public sector, and lengthy judicial process—have contributed to Italy experiencing one of the lowest productivity growth rates among advanced economies over the last three decades”.
2. It should be pointed out that Kaldor’s contribution is often considered as extraneous to the Post-Keynesian tradition, mainly because Kaldor made the assumption of full employment in many of his works. This assumption finds its rationale in two considerations. First, Kaldor considers that that full employment can be associated to ‘disguised unemployment’. Therefore, full employment is not necessarily associated to the most efficient allocation of the workforce. Second, Kaldor stressed that the direction of economic policy ultimately depends on “the distribution of power between Capital and Labour” (Kaldor 1989, p. 97). When workers cannot affect the direction of economic policy and firms’ strategies, firms can react to the increase of productivity via a reduction of employment. Accordingly, it is the distribution conflict between different social groups (or classes) which ultimately settles the path of employment and labour productivity. This is in line with Kalecki’s view (1943). We thank an anonymous referee for drawing our attention on this issue.
3. In this respect, Kaldor criticizes the Neoclassical view that as output increases, also the number of firms increases. As markets are not perfectly competitive, the existing firms react to the higher output by expanding their size in order to obtain larger market shares. Kaldor also criticizes Marx’s view that it is competition which stimulates innovations, arguing that, as a norm, they are produced in oligopolistic market structures.
4. As an example of mature productive sectors, ISTAT (2014, 2015) mentions agribusiness and luxury.
5. More available data on credit supply would allow us to fully test it for the entire period under consideration. In particular, the proxy for the credit supply, taken from the Bank Lending Survey, is available since 2003.
6. These perceived problems have been viewed as a symptom of the decline of the Italian economy. Economic decline is a concept related to the long term and for this reason it is possible to identify only a current tendency by comparing the contemporary Italian experience of the last two decades with previous historical events occurring in the second half of the 17th century. According to Cipolla (1993, see also Olson 1982), the first Italian economic decline was characterized by the following factors: drastic decline in exports; prolonged process of disinvestment in manufacturing; obsolete method of production and organization; high pressure of taxation; low labour productivity; preponderance of rent seeking. The effects of all these factors caused the contraction of economic

activity and production and the fall of average real living standards for the population. Many of these factors and effects are present in the current Italian economic stagnation.

7. Graziani also refers to two fundamental political facts: the judicial investigation into corruption in the Italian political class (known as Tangentopoli) and the implementation of severely restrictive fiscal policies. The crisis of legitimation of the political parties led to two “technical” Governments, with Prime Ministers Giuliano Amato (1992–1993) and Carlo Azeglio Ciampi (1993–1994).

8. Levrero and Stirati (2005) provide evidence of this.

9. Cingano et al. (2010) find that Italian firms react to the decrease of demand by limiting firing and not hiring. This may depend on two phenomena: first, labour hoarding, normally in the cases of innovative firms; second, disguised unemployment for firms (extremely numerous in Italy, and particularly in Southern Italy) which employ relatives, involving a psychological cost of firing. Moreover, most Italian firms (particularly in Southern Italy) do not demand high-skilled workers. This is because, as shown above, they operate in mature sectors, where high skills are not required and, since most of the young unemployed are individuals with high human capital, they find it difficult to be hired for tasks consistent with their skills. Three outcomes derive: intellectual unemployment, underemployment, brain drain.

10. As Stockhammer and Ramskogler (2007) point out, (1) in a capitalist economy, uncertainty is not evenly distributed among social classes and (2) workers, in particular, suffer from higher levels of uncertainty, due to job insecurity.

11. Also demography is related to these dynamics. As labour precariousness negatively affects fertility, in the long-run there would be a decline of labour supply and a consequent decline of potential GDP. We do not consider demographic factors explicitly.

12. Coad et al. (2011) estimate a reduced-form VAR to analyse the joint evolution of employment growth, sales growth, growth of profits and labour productivity growth of Italian manufacturing firms for the period 1989–1997, finding evidence of Kaldor–Verdoorn effects.

13. All the variables used in the VARs are in log-levels, except the proxy used for credit supply.

14. The Hodrick–Prescott filter is a standard procedure in the literature and in the policy institutions such as the OECD. While this filter has some drawbacks in terms of numerical precision, it is preferable to band pass filters when the main objective is to detect turning points in the business cycle, as shown in Nilsson and Gyomai (2011), who compare Hodrick–Prescott filter with the Christiano–Fitzgerald filter. As a robustness check, we apply the Christiano–Fitzgerald filter to the variables of our VAR and compare the resulting dynamics with those arising under the Hodrick–Prescott filter. We find that, under the qualitative point of view, the dynamics of the considered variables are unaffected by the choice of a particular filtering method, similarly to Larsson and Vasi (2012). Results are available on request.

15. As explained in Bonci (2011), a credit tightening (growth) can be induced by a restrictive (expansionary) monetary policy.

16. ESA 2010 is the internationally EU accounting framework for a systematic description of an economy that allows comparison among European countries. For technical details, please read the technical explanations in the Eurostat website: <http://ec.europa.eu/eurostat/web/esa-2010>.

17. In particular, the criteria followed in the tests are two sequential modified likelihood ratio test statistic (each test at 5% level), final prediction error, Akaike information criterion, Schwarz information criterion and Hannan–Quinn information criterion. Also for the following four VAR estimations two lags is the lag length that emerged from the same tests. A separate technical appendix, where we also report autocorrelation tests and residual normality test, is available for interested readers. Since, for all the tests, the results are the same discussed for the first VAR, we omit them in the paper and suggest the interested readers to look at the technical appendix.

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18. The dynamic transmission of shocks is independent of the Cholesky ordering, also for the following impulse response functions. The graphs with the other Cholesky ordering are available upon request.

19. The exact question is “Over the past 3 months, how have your bank’s credit standards as applied to the approval of loans or credit lines to enterprises changed? Please note that we are asking about the change in credit standards, rather than about their level.” Notice that there is also a similar question related to the future 3 months. These data are not HP filtered.

20. The so-called Veblen effect establishes that as the unitary price increases so does demand. This effect, in particular, applies to luxury goods.

21. Recent data released by Istat in June 2017 documents that the improvement of the Italian trade balance is largely due to the decline of import.

22. In particular, an open-economy model should take into account more variables besides the net exports, at least the real exchange rate. As explained in the concluding comments, we leave this issue for future research.

23. For example, Ory and Lemzeri (2012) show how French cooperative banks changed their organization and model after the Great Recession, while Fiordelisi and Mare (2014) find that the 2007–2009 financial crisis did not affect the degree of competition and financial stability in European cooperative banks.

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**Table 1** VAR lag order selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	321.79	NA	9.54e-09	- 12.79	- 12.72	- 12.76
1	391.23	130.54	6.97e-10	- 15.41	- 15.18	- 15.32
2	410.17	34.10 <sup>a</sup>	3.84e-10 <sup>a</sup>	- 16.01 <sup>a</sup>	- 15.62 <sup>a</sup>	- 15.86 <sup>a</sup>
3	413.56	5.82	3.94e-10	- 15.98	- 15.45	- 15.78
4	414.85	2.12	4.41e-10	- 15.87	- 15.19	- 15.61
5	416.61	2.74	4.86e-10	- 15.78	- 14.94	- 15.46

*LR* sequential modified likelihood ratio test statistic (each test at 5% level), *FPE* final prediction error, *AIC* Akaike information criterion, *SC* Schwarz information criterion, *HQ* Hannan-Quinn information criterion

<sup>a</sup>Lag order selected by the specific criterion

**Table 2** Autocorrelation LM test (H0: there is no serial correlation at specified lag)

Lags	LM-Stat	Prob.
1	5.565	0.234
2	4.579	0.333
3	0.168	0.997
4	6.553	0.162
5	4.815	0.307

Probabilities from Chi square with 4 *df*

**Table 3** Residual normality test (H0: residuals are multivariate normal)

Component	Skewness	Chi-sq	<i>df</i>	Prob.
1	0.319	0.896	1	0.344
2	- 0.133	0.156	1	0.693
Joint		1.052	2	0.591
Component	Kurtosis	Chi-sq	<i>df</i>	Prob.
1	3.123	0.033	1	0.855
2	2.594	0.364	1	0.547
Joint		0.397	2	0.820
Component	Jarque-Bera	<i>df</i>	Prob.	
1	0.930	2	0.628	
2	0.520	2	0.771	
Joint	1.449	4	0.836	



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