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Why are Keynesian Multipliers Larger in Hard Times?

A Palley-Aftalion-Pasinetti explanation

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Abstract

We use the AMECO database to confirm that textbook multipliers are nearly always greater than one and that they increase during recessions. Propensity to import falls in recessions through the combined effects of the amplified fall in investment (Aftalion) and the high import content of investment (Palley). A change in saving behavior (Pasinetti) may also raise the multiplier. These findings strongly support the need for countercyclical fiscal policies during recessions.

Keywords

fiscal multipliers; recession; globalization; import content; investment accelerator;

JEL classification

E12; E62; F62

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Introduction

The multiplier is a macroeconomic cause-and-effect mechanism by which investment affects employment. It was first analyzed by Kahn (1931) and then extended by Keynes in his path-breaking *General Theory* (1936) in which private (or public) spending is positively linked to national income. During recessions involving high unemployment governments should increase public spending in order to sustain effective demand and profits “so that entrepreneurs will hire all domestic workers willing and able to work” (see Davidson, 2010).¹ Keynesians argue that reducing government deficits at such times would only deepen the recession.

Neoclassical economists including New Keynesians use maximizing intertemporal models to argue that at best Keynesian policies have positive short-run effects that are quickly reversed.²

Obviously, such conflicting theories have spawned many statistical studies of the true value of the multiplier and the utility of countercyclical fiscal policies. Some of the more extreme empirical studies take this argument further, identifying negative fiscal multipliers and advocating expansionist austerity along the lines of Giavazzi and Pagano (1990). Controversy intensified when the IMF, among other institutions, officially acknowledged it had underestimated multipliers during the 2008 recession: “The main finding, based on data for 28 economies, is that the multipliers used in generating growth forecasts have been systematically too low since the start of the Great Recession” (IMF, 2012, p. 41).

Despite recent debates about the value of multipliers and the use of more complex econometric techniques, we still have no detailed explanation of why multipliers vary over the

¹ The Keynesians' purpose is obviously not to support policies to stimulate economic growth *per se*: growth is only a means to the true Keynesian end of full employment. Growth is no longer needed when full employment is achieved. Moreover, in a world of limited natural resources (Weisskopf, 2014), the road to full employment may mean shorter working hours (Husson, 2015). We briefly discuss these points in the conclusion.

² Taylor (2000, p. 90) explains the reasoning: “Suppose there is a fiscal stimulus, and suppose it is permanent rather than temporary. This stimulus shifts the AD curve to the right, and there is a new intersection [between the IA and AD curves]. GDP rises, but in the short run, the inflation rate does not rise. Over time however, the inflation rate does rise, and the IA line shifts up. The IA line continues to shift up until real GDP is back to potential and the inflation rate is higher.”

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business cycle. Our purpose here is to offer such an explanation for changes in multiplier values during recessions and to assess long-run tendencies.

First, we present a simple method for computing a proxy of the multiplier for a set of developed countries over the long run. Second, we identify in our database a rise in multiplier values during most recessions. Third, we use the investment accelerator (Aftalion) and import content (Palley) to explain why the Keynesian multiplier increases during recessions. Fourth, we provide insights into changing saving behaviors from Pasinetti, which may also influence multiplier values. Finally, we draw some conclusions.

1. Methodology and data

1.1 Simple is better than complex

In the belief that simple is better than complex, our methodology deals with very straightforward Keynesian multipliers. In this we agree with Krugman (2000, pp. 40-1) on the need to use simple models when dealing with the economic policy issues of the world we live in:

The point is not that these models are accurate or complete, or that they should be the only models used. Clearly they are incomplete, quite inadequate to examining some questions, and remain as full of *hoc* as ever. But they are easy to use, particularly on real-world policy questions, and often seem to give more or less the right answer. [...] What we know pretty well, from decades of trying to give micro-foundations to macro, is that logical completeness and intellectual satisfaction are not necessarily indications that a model will actually do a better job of tracking what really happens. For many purposes the small, *ad-hoc* models are as good as or better than the carefully specified, maximizing intertemporal model.

Sacrificing simplicity and including more assumptions and more supposedly realistic microeconomic behaviors would not significantly improve the model's explanatory power.

We rely here on simple Keynesian multipliers. Our fiscal multipliers can be calculated as in any macroeconomics textbook using just data for real output, real consumption, and real

imports. They are calculated for each country every year, enabling us to review the changes in fiscal multipliers over time and space on a very broad scale.

We begin with the traditional decomposition of aggregate output/income

$$Y = C + I + G + X - M \quad (1)$$

where Y is the level of real output, C real consumption, I real investment, G real public spending, X real exports, and M real imports.

Next, we assume that consumption and imports vary with output according to two very simple macroeconomic functions

$$C = C(Y) = cY \quad (2)$$

$$M = M(Y) = mY \quad (3)$$

where c is the marginal (and average) propensity to consume out of income and m the marginal (and average) propensity to import out of income.

These two equations simply tell us that the more the economy grows, the more it consumes and the more it imports. We can thus rewrite the decomposition of output

$$Y = cY + I + G + X - mY \quad (4)$$

At this stage, we take investment, public spending, and exports to be "autonomous" components of aggregate output. We do not claim that these three sources of demand are independent of output in reality, but we assume so for present purposes. From this set of assumptions, it follows that aggregate output can be written

$$Y = \left(\frac{1}{1-c+m} \right) (I + G + X) \quad (5)$$

In this paper, the fiscal multiplier, k , is then given by

$$k = \frac{\partial Y}{\partial G} = \frac{1}{1-c+m} \quad (6)$$

1.2 Marginal or average propensities?

By dividing first consumption and then imports by output, we are able to calculate the two *average* propensities, whereas equation 6 requires *marginal* propensities. What we call propensities are rather levels of consumption and imports as shares of GDP, and it is only because we assume very basic behavioral equations in (2) and (3) that our *theoretical* marginal and average propensities are equal.

In the *empirical* part of the paper, our multiplier calculations may be viewed as a proxy for the “true” theoretical multiplier. Any more comprehensive study would require more sophisticated behavioral equations for consumption and imports.³ We use average propensities to account for marginal propensities: the main issue here is that calculating marginal propensities to spend from one year to the next using the AMECO database⁴ yields economically meaningless results. For instance, in the United States for the year 2001, the marginal propensities to spend and to import were about 173% and 68%, which gives a spending multiplier of -17.2 . One of the most striking instances in this respect is Italy with its multiplier of -111.8 for 1981.

It is still possible, though, to calculate the marginal propensity to consume for each country by a simple regression for the period 1960–2014 and then to compare these results with the mean of the average propensities. Table 1 plainly shows that, with minor exceptions, the two values are similar, so confirming the macroeconomic and statistical work of Kuznets (1946) for the long run.

³ Equations implying autonomous components or other variables such as interest rates.

⁴ AMECO is the Annual Macroeconomic database of the European Commission (available at: http://ec.europa.eu/economy_finance/db_indicators/ameco/index_en.htm). We use the following series to build our multipliers: Gross domestic product at 2010 market prices (OVGD) for real output (Y), Private final consumption expenditure at 2010 prices (OCPH) for real consumption (C), and Imports of goods and services at 2010 prices (OMGS) for real imports (M). Data were extracted in April 2015.

Table 1: Marginal and Average Propensities in the Long Run

Country	Period	Model (1) $C_t = \alpha + cY_t$		Model (2) $(C_t - C_{t-1}) = c(Y_t - Y_{t-1})$		$c = C_t/Y_t$
		Marginal propensity to consume	R^2	Marginal propensity to consume	R^2	Mean average propensity to consume
Belgium	1960-2014	0.50	0.99	0.40	0.77	0.53
Bulgaria	1991-2014	0.72	0.96	0.59	0.46	0.62
Czech Republic	1990-2014	0.46	0.96	0.47	0.64	0.49
Denmark	1960-2014	0.42	0.99	0.43	0.73	0.50
Germany	1960-2014	0.58	0.99	0.48	0.75	0.56
Estonia	1993-2014	0.56	0.98	0.54	0.92	0.51
Ireland	1960-2014	0.40	0.99	0.39	0.81	0.56
Greece	1960-2014	0.74	0.98	0.58	0.76	0.62
Spain	1960-2014	0.55	0.99	0.58	0.93	0.60
France	1960-2014	0.54	0.99	0.47	0.86	0.54
Italy	1960-2014	0.61	0.99	0.53	0.79	0.59
Cyprus	1994-2014	0.79	0.98	0.89	0.84	0.62
Latvia	1995-2014	0.62	0.98	0.70	0.87	0.62
Lithuania	1995-2014	0.72	0.98	0.75	0.92	0.64
Hungary	1995-2014	0.52	0.90	0.52	0.69	0.54
Netherlands	1960-2014	0.43	0.98	0.40	0.75	0.49
Austria	1960-2014	0.51	0.99	0.41	0.72	0.56
Poland	1990-2014	0.53	0.98	0.50	0.76	0.62
Portugal	1960-2014	0.66	0.99	0.64	0.85	0.60
Romania	1990-2014	0.92	0.98	0.74	0.85	0.54
Slovenia	1990-2014	0.50	0.95	0.35	0.50	0.55
Slovakia	1994-2014	0.51	0.97	0.43	0.74	0.59
Finland	1960-2014	0.50	0.99	0.39	0.80	0.53
Sweden	1960-2014	0.40	0.99	0.33	0.70	0.50
United Kingdom	1960-2014	0.71	0.99	0.62	0.87	0.58
Norway	1960-2014	0.38	0.96	0.40	0.75	0.39
Switzerland	1960-2014	0.53	0.98	0.38	0.71	0.57
United States	1960-2014	0.70	0.99	0.65	0.94	0.64
Japan	1960-2014	0.57	0.99	0.81	0.81	0.60

Source: Ameco and authors' calculations

Note: Given the purpose of the paper (linking changing multipliers and recessions), we do not address the issue of nonstationarity for model 1. But model 2 provides OLS regression in first differences; first differences are usually stationary series.

In the rest of the paper, we use average propensity because, as explained above, it is a reasonable proxy for marginal propensity, it is easy to calculate, and the results obtained are consistent for the entire sample, so we do not encounter meaningless values for the Keynesian multiplier. This technique is used, among others, by Sinclair and Sutcliffe (1988), Faggian and Biagi (2003), Laski *et al.* (2010), and Pusch (2012). Moreover, as recognized by Gechert (2014, p. 96), “When calibrating values of the marginal propensity to spend for simulations, usually reference is made to the average propensity to spend, i.e. the ex-post relation of spending to income within the same period”. Our method entails some bias because marginal and average propensities may diverge to varying degrees over time (see appendix for more explanations).⁵

1.3 Traditional results for Keynesian economists

Beyond the caveats about our methodology, the traditional textbook comments apply for the multipliers in equation (6): the greater the propensity to consume, the larger the multiplier; the greater the propensity to import, the smaller the multiplier. Willingness to save and the openness of the economy are the two leakages that make increased public spending less effective. The second round effect of the initial public spending will depend on whether households save or spend a significant share of the additional income they receive, and if they

⁵ Another remark about our methodology is called for: propensity to consume is traditionally based on gross disposable income and not gross domestic product. This specific interpretation has to be remembered in the rest of the paper. In particular, our propensity to consume does not explicitly include tax and redistribution. So to close our model, it has to be specified that the complement to one to this propensity includes both saving and net redistribution (through taxes and current transfers received and paid by households). Even though tax and redistribution are not explicitly present in our framework (they are hidden in the complement to one to the propensity to consume), this does not mean that we calculate tax free multipliers. Formally, we can easily introduce the influence of income tax and transfer payments into the model. Equation (2) would then be rewritten:

$$C = C(Y) = c \frac{Y_d}{Y} Y \quad (2')$$

Where $Y_d = Y - T + TR$: gross disposable income (Y_d) received by consumers is given by gross domestic product (Y) minus income taxes (T) plus transfer payments (TR). Plugging (2') into (4) gives the value of the multiplier: $k' = 1/(1 - c\phi + m)$ with $\phi = Y_d/Y$. Nevertheless, this formal model cannot be used in this article because our database does not contain statistics on gross disposable income since 1960. However, it clearly indicates that an increase in transfer payments increases our estimation of the multiplier, whereas an increase in income taxes decreases it.

do spend, it will depend on whether they spend mainly on domestic goods and services or on foreign ones. The value of fiscal multipliers is determined by just two parameters, and the differences between multiplier values therefore lie in different propensities to consume and/or import for different countries or different periods.

Using the AMECO database, we calculate multipliers for 29 countries over the 1960–2014 period. While adopting this historical perspective, we can draw some classic conclusions about these simple multiplier values and the changes they undergo. Table 2 sets out some preliminary results.

Table 2: Historical Trends in Multiplier Values

Country	1960	1970	1980	1990	2000	2010	Variation (1960-2010)
Belgium	1.47	1.20	1.16	1.05	0.88	0.81	-44.9%
Bulgaria				1.00	1.31	1.06	
Czech Republic				1.49	1.17	0.88	
Denmark	1.66	1.52	1.45	1.31	1.14	1.05	-37.1%
Germany	1.75	1.68	1.66	1.54	1.44	1.23	-29.5%
Estonia					1.05	0.86	
Ireland	2.13	1.57	1.37	1.14	0.78	0.76	-64.2%
Greece	2.19	1.82	1.82	1.92	1.52	1.65	-24.7%
Spain	2.48	2.25	2.22	1.85	1.49	1.44	-42.1%
France	1.97	1.78	1.68	1.61	1.41	1.39	-29.1%
Italy	1.89	1.86	1.84	1.73	1.58	1.51	-20.0%
Cyprus					0.99	1.12	
Latvia					1.20	1.10	
Lithuania					1.29	0.97	
Hungary					1.10	0.80	
Netherlands	1.41	1.33	1.29	1.15	0.95	0.84	-40.4%
Austria	1.76	1.52	1.41	1.33	1.17	1.07	-39.3%
Poland					1.77	1.40	
Portugal	2.19	1.91	1.86	1.67	1.45	1.40	-36.4%
Romania					1.51	1.42	
Slovenia					1.08	1.09	
Slovakia					1.09	0.83	
Finland	1.58	1.51	1.42	1.43	1.22	1.19	-25.0%
Sweden	1.68	1.45	1.39	1.28	1.10	1.06	-36.8%
United Kingdom	1.77	1.65	1.63	1.63	1.56	1.50	-15.0%
Norway	1.37	1.23	1.23	1.19	1.14	1.15	-15.8%
Switzerland	1.69	1.52	1.42	1.23	1.10	1.01	-40.3%
United States	2.30	2.27	2.28	2.23	2.04	2.10	-8.9%

Japan	2.55	2.07	2.10	1.90	1.84	1.83	-28.3%
<i>Average</i>	1.88	1.67	1.62	1.48	1.27	1.18	-37.4%

Note: The Table gives the annual values (in 1960, 1970 and so on)

Source: Ameco and authors' calculations

Table 2 supports two striking conclusions. (i) The multipliers are nearly always greater than one; (ii) in general, the multipliers declined over the period, reflecting the increased openness of the world's economies. The first conclusion runs counter to conventional neoclassical wisdom; the second is widely accepted by economists of different persuasions.

The only countries where multipliers are less than unity (Netherlands, Belgium, and Ireland) are small, very open economies. This result is consistent with the standard textbook claim that multipliers are higher in large, relatively more closed economies. The highest multiplier value is found for the largest economy in the sample, the United States. This has important implications: countercyclical fiscal policies will generally still produce macroeconomic effects in such economies.

The second conclusion is that there has been a generalized decline in multiplier values, which have fallen on average by more than one-third over the period. The fall has been even greater for many countries and once again the United States stands out since the decline in its multiplier value has been far more moderate than elsewhere (8.9%). This generalized decline in multiplier values was expected because of the increased openness of most of the world's economies since the end of World War II, and more specifically since the end of the Bretton Woods system. This increased openness is the most commonly used argument against implementing Keynesian demand policies, because stimulus policies would allegedly result in increased leakages through imports instead of increased domestic production. Following the tradition of the Harrod trade multiplier or the Balance-Of-Payments-Constrained Growth model (BOPCG, McCombie and Thirlwall, 1993), it may even be assumed that increasing openness is one of the main causes of the reduced scope for economic growth, because the

growth rate compatible with the external balance is reduced by the increased propensity to import. The BOPCG approach reveals that increased activity leading to increased demand for foreign currency due to higher imports impedes growth. This is a consequence of Thirlwall's famous law (1979) that "the maximum growth rate that BOP-restricted economies can reach is determined by the relation between income elasticities of demand for exports and imports and the exogenous rate of world GDP growth" (Médici and Panigo, 2015, p. 198). These factors clearly justify coordinating countercyclical fiscal policies among countries to limit the negative effects of BOP restrictions on growth and to maximize the values of the multipliers. In other words, during recessions, cooperation among countries is the best instrument for offsetting recessionary spirals.

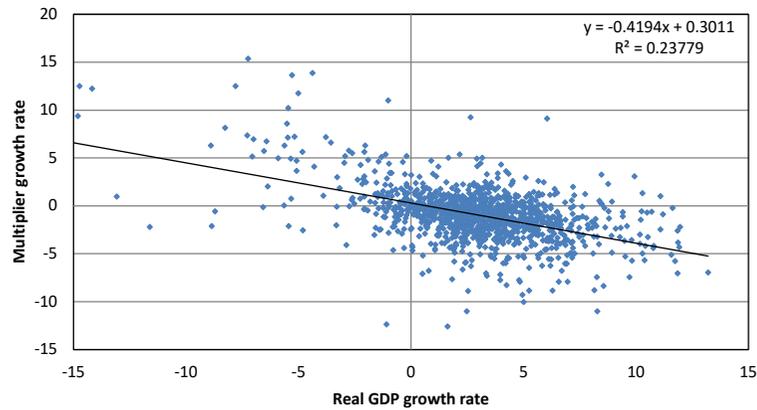
After this brief survey of the long-run changes in multiplier values, we deal in the third and fourth sections with a shorter time horizon, since we try to figure out the determinants of changes in multiplier values during recessions. First, though, we identify and categorize recessions in the sample in the next section.

2. Linking multipliers and recessions

In this section, we deal with the short term and with the relationship between fiscal multipliers and the real GDP growth rate.

Figure 1 illustrates the relationship between growth rates of the multiplier and GDP in the same year for the countries in our sample. The two growth rates are inversely related. For the rest of the paper, we focus on how multipliers change during recessions.

Figure 1: Annual GDP growth rates and rates of change of multipliers



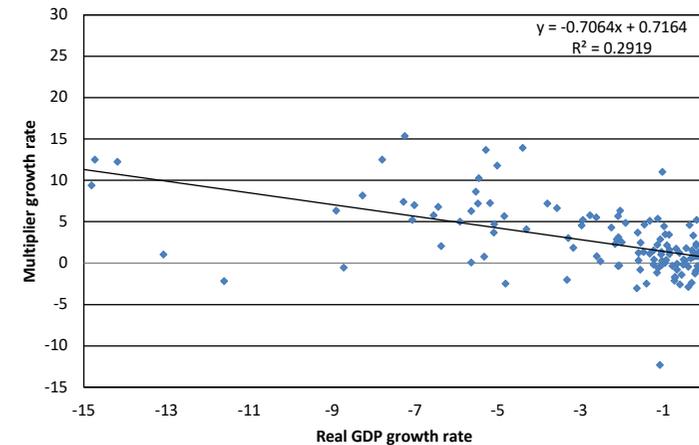
Source: Ameco and authors' calculations

2.1 What happens with multipliers during recessions?

We define a recession here simply as a negative GDP growth rate recorded in the database. We find 165 national recessions from our sample for the period 1961–2014. Most of them are observed during three specific periods of international macroeconomic instability, namely: the first oil crisis (15 recessions in 1974 and 1975), the international monetary tightening of the early 1980s following the Fed's strategy from August 1979 to sharply raise the federal funds rate (16 observations from 1980 to 1982), and during the “Great Recession” engendered by the 2008 international financial crisis (35 recessions from 2008 to 2010). The early 1990s is another period for which various recessions are observed (23 from 1991 to 1993); several concurrent factors can explain this cluster: financial disturbances in the USA, geopolitical uncertainties, the 1992 European Monetary System crisis, and the Scandinavian debt crisis which affected four countries in our sample—Finland, Sweden, Norway, and Denmark. Most

of these recessions emerged during “crisis” periods in a Gramscian sense:⁶ a crisis is a period where the old order no longer holds, but new institutional structures are not yet in place. Our first cluster of recessions (1974–75) corresponds to the collapse of the “regulated” Social Structure of Accumulation (Kotz, 2003), or to the end of what the French Regulation School terms the Fordist growth regime (Neilson, 2012). The second cluster of recessions (early 1980s) stems from the birth of Neoliberal institutional structures. The last cluster of recessions (since 2008) is associated with the (not necessarily final) collapse of the Neoliberal growth regime.⁷ Figure 2 shows the rates of change of the multipliers when recessions are observed.

Figure 2: Rates of change of multipliers when recessions are observed, 1961–2009



Source: Ameco and authors' calculations

⁶ We thank Professor Ray Boddy for pointing out this correlation between our episodes of recessions and the timing of different SSAs.

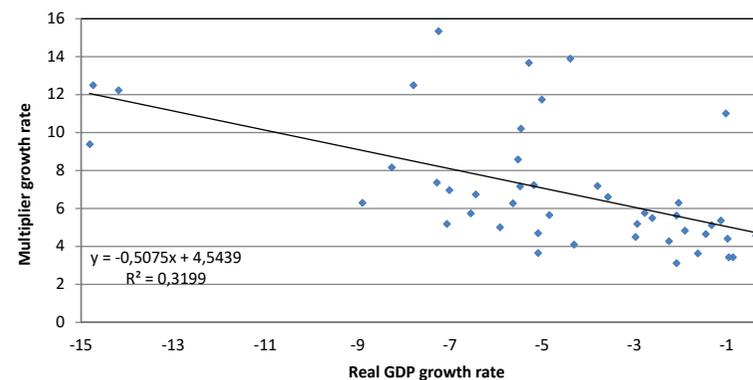
⁷ It can also be observed that some of the early 1990s recessions correspond to the introduction of the European Monetary Union, while some of the post-2010 recessions stem from its contradictions.

Figure 2 confirms the negative statistical relationship between negative GDP growth rates and changes in multiplier values.⁸ In hard times, multipliers tend to be larger than before the recession. Moreover, it is also noticeable that the worse the recession, the greater the positive change in the multiplier.

2.2. What happens when we select significant increases in the multiplier?

As already stated, we seek to identify relationships between annual changes in fiscal multipliers and GDP growth rates. But from now on, we extract from our full sample only the significant and positive variations in the multipliers when negative real GDP growth rates are observed. Arbitrarily, we decide to consider a variation in the multiplier as significant if its growth rate is at least 3%. The sample contains 47 observations. We then simply plot the corresponding values of GDP growth rates to draw our cluster of points. This gives Figure 3.

Figure 3: Negative real GDP growth rate when multiplier increases are at least 3%, 1961–2009



Source: Ameco and authors' calculations

As in the previous figures, we observe a negative statistical relationship between positive changes in the multiplier and the negative real GDP growth rate. Moreover, this relationship seems to be more statistically significant than before: marked increases in the multiplier usually correspond to periods of recession.

3. A Palley-Aftalion explanation: changing import propensities

An increase in the multiplier during recessions is necessarily due either to changes in the propensity to import, or changes in the propensity to consume, or a combination of the two. This section examines the origins of changes in the propensity to import and the next section in the propensity to consume.

In dealing with changes in propensities to import, we rely on the methodology in Palley (2009). In his inspiring paper, Thomas Palley reinterprets the traditional presentation of GDP,

⁸ This relation appears to be weakened by the recessions recorded from 2010 onward. Several recessions observed since then, especially in the Eurozone, are characterized by small decreases in the multiplier, weakening our statistical relationship. These recessions are accompanied by falls in the propensity to consume (because of austerity policies and precautionary saving) and/or increases in propensity to import (because of expanded international openness), both tending to reduce the multiplier value. We leave fuller analysis of this paradox for further research.

while attributing to each component of aggregate demand its content in imports. Palley is able to rewrite GDP as

$$Y = (1 - \alpha)C + (1 - \beta)I + (1 - \gamma)G + (1 - \delta)X \quad (7)$$

Here, we keep the traditional import function, but we separate the average propensity to import (m) into four propensities to import applying to consumption (α), investment (β), public expenditure (γ), and exports (δ):

$$Y = cY + I + G + X - mY \quad (4)$$

$$\text{with } m = \alpha \frac{C}{Y} + \beta \frac{I}{Y} + \gamma \frac{G}{Y} + \delta \frac{X}{Y}$$

$$\text{and } \alpha = \frac{C_m}{c}, \beta = \frac{I_m}{I}, \gamma = \frac{G_m}{G}, \delta = \frac{X_m}{X}$$

where C_m , I_m , G_m , and X_m are respectively the import contents of consumption, investment, public expenditure, and exports.

Bussière *et al.* (2011) present an empirical investigation with OECD data that allows them to establish values for these parameters for 1995, 2000, and 2005. Table 3 reproduces data from that article for the year 2005.

Table 3: Import contents of each component of aggregate demand for 2005

Country	Import content of private consumption	Import content of government consumption ⁹	Import content of total investment	Import content of exports
Germany	22.6	8.6	31.1	27.2
France	22.7	8.7	25.4	27
Italy	21.3	7.2	27.3	29
Spain	24	11.3	28.3	34.2
Austria	28.7	11.5	42.7	34.7
Denmark	31.8	10.4	39.1	34.9
Netherlands	30.3	11.3	39.3	34.9
Ireland	37.1	14.4	41.5	50.7
Greece	24.1	9.9	35.5	25.9
Portugal	29	9.5	36.1	38.9
Belgium	33.6	12.4	49.7	43.2
Switzerland	24.4	9.3	33.9	25.3
Norway	32	10.9	36.4	16.2

⁹ The decomposition of GDP is here based on demand, so that government consumption encompasses all public spending consisting in demand for goods and services but that does not increase the productive capital (public investment is grouped with private investment). See OECD Input/Output tables methodology for full details.

Sweden	28.1	11.2	43	33.2
Finland	26.8	12	32.4	38
Iceland	14.8	5.5	24.4	27.1
Japan	11.7	6	15.3	15.4
Korea	24.2	10.5	28.9	38.6
United States	11.9	6.2	17.3	12.3
United Kingdom	27.2	12.5	25.4	18.6
Canada	25.8	9.8	34.8	27.4
Australia	18.4	9.9	26	14
New Zealand	21.4	9.8	39.3	17.5

Source: Bussière et al. (2011, p. 35)

The table shows that the import contents of exports and investment are larger than the import contents of both private and government consumption expenditure.¹⁰ These differences result from the spending patterns of different agents: households spend on services that are difficult to delocalize; transnational corporations, by contrast, engage in intra-corporation imports based on their international supply chains.

This difference in import contents may be used to explain the fall in the average import propensity during recessions. But, to be complete, the argument needs to include a reference to a standard concept of earlier economic theory: the accelerator principle developed by Aftalion (1908) and Clark (1917). Initially, the accelerator principle simply claims that investment reacts strongly to changes in economic activity, so that the rate of change of investment outstrips the rate of change of GDP

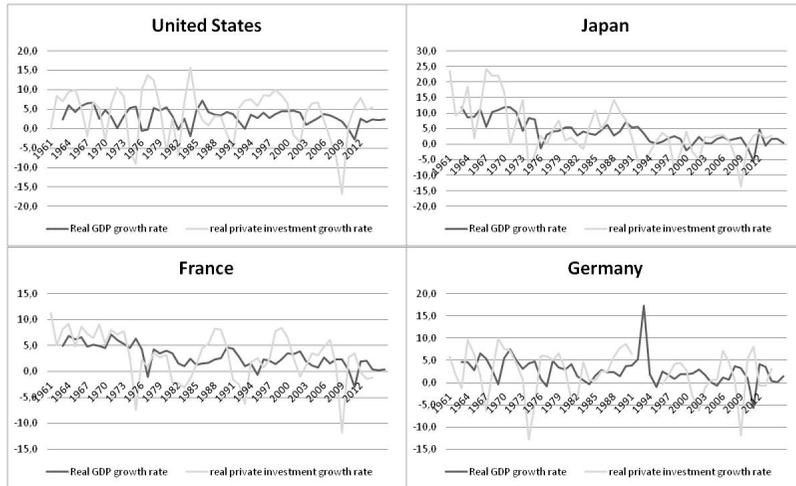
$$I_t = A(Y_t - Y_{t-1}) \text{ with } A = \frac{K}{Y} > 1 \leftrightarrow \frac{\Delta I}{I} > \frac{\Delta Y}{Y} \quad (8)$$

The accelerator is clearly a dynamic principle, whereas our theoretical model (equations 1–6) deals only with comparative statics. Here, we explicitly choose to omit the accelerator concept

¹⁰ Except for Norway, the United Kingdom, Australia, and New Zealand, where the imports' content of exports is less than the imports' content of private consumption.

from our theoretical model so as to keep it as simple as possible.¹¹ We use the accelerator concept alone to interpret the stylized facts. Investment volatility may be observed at the macroeconomic level:

Figure 4: Investment accelerator



Source: Ameco and authors' calculations

During a recession, investment falls more sharply than GDP thus reducing the ratio of investment to GDP. Since the import content of investment is greater than the import content of other expenditures, the average import propensity declines and the multiplier is strengthened:

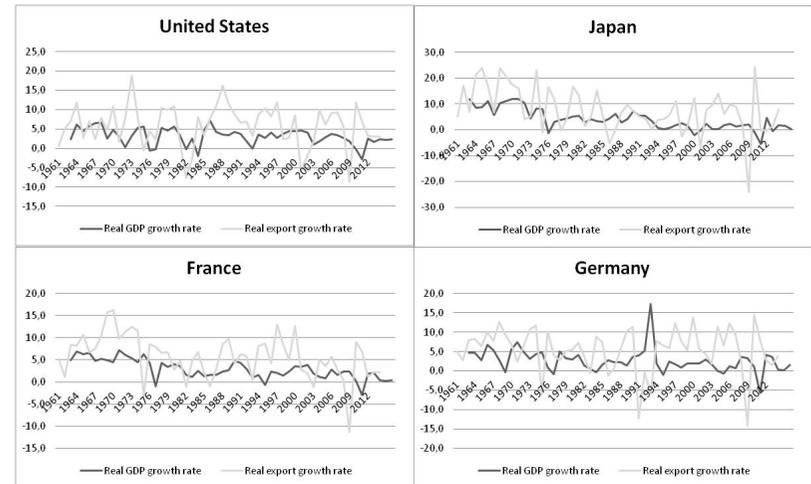
$$\frac{\Delta Y}{Y} < 0 \leftrightarrow \frac{\Delta I}{I} \ll 0 \leftrightarrow \frac{I}{Y} \text{ drops} \leftrightarrow \left(\beta \frac{I}{Y}\right) \text{ drops} \leftrightarrow m \text{ drops} \leftrightarrow k \text{ increases}$$

¹¹ The accelerator concept implies that investment is endogenous and dependent on output. But, this complication does not lead to a significant change in the multiplier formulas, as can be seen in Samuelson's classic oscillator model.

This mechanism can be seen to be operative for example in the United States in the 2008–2009 recession: output declines by 2.8%, but investment falls by 16.8%, thus leading to a fall in the ratio of investment to GDP from 16.5% to 14.1%, and finally, because of the larger import content of investment goods, a reduction in the ratio of imports to GDP from 16.2% to 14.4%. We think that this combination of the accelerator principle and the import content of investment is the main reason for the increase in the multiplier value during recessions, as is reflected in Table 4.

Similar reasoning may be applied to export volatility. Even though the rate of change of domestic exports is not directly linked to domestic growth, it can be seen that the rate of change of exports is greater than the rate of change of GDP.

Figure 5: Exports amplifier



Source: Ameco and authors' calculations

This “export amplifier” relies on the harmonization of economic situations around the world, with each country’s domestic growth being increasingly aligned on world growth because of globalization and increased international trade. These over-reactions of exports to GDP lead to changes in the average propensities to import, since the import contents of exports are larger than the import contents of consumption and public expenditure. Consequently, a recession may lead to a shrinkage in exports, and so to a lower propensity to import, thereby boosting the multiplier value.

In short, recessions see investment and exports collapse but allow for multipliers to recover because of high import contents of investment and exports.

4. Adding an explanation based on Pasinetti: changing consumption propensities

Whereas the changes in import propensities are crucial to understanding why fiscal multipliers are larger in hard times, another determinant is often understated when it comes to evaluating changes in multiplier values. The propensity to consume is not constant during recessions. For example, the average propensity to consume changes in different ways for the 2008–09 recession: for some countries, the recession first induces a strong, one-year increase in the propensity to consume (France, Italy, Germany, etc.), and then a decline for the following years; while for other countries, the propensity to consume falls more or less sharply (Bulgaria, Cyprus, Latvia, Lithuania, Romania) or remains pretty much unchanged (Spain, United States, United Kingdom, etc.) throughout the recession. These shifts in the propensity to consume have implications for the multiplier value, and we consider the plausible explanations for these changes through the lens of Pasinetti’s work on social classes (Pasinetti, 1962).

The typically Keynesian argument (already present in Keynes, 1936) for consumption behavior is that workers and rentiers do not have the same propensities to consume.¹² Whereas (poor) workers tend to spend roughly all their incomes on consumption due to budgetary constraints, (rich) rentiers are able to save a significant share of their incomes. For the community as a whole, the average propensity to consume then depends on income distribution. In a situation of unemployment, there is room for public policies designed to redistribute income from (rich) rentiers to (poor) workers so as to increase the community’s propensity to consume, and consequently to raise aggregate spending and employment. But, other things being equal, recessions may have ambiguous effects on the community’s propensity to consume. On the one hand, if the recession hits (low-paid) workers harder through unemployment than (rich) rentiers through falls in profit incomes, it may be expected that the resulting increase in inequality will reduce propensity to consume. On the other hand, if the recession hits the financial incomes of (rich) rentiers hard, propensity to consume may rise.

Beyond the changes in income distribution, other factors may influence the propensity to consume during a recession, but once again, these factors may have diverse effects. The first factor that has to be noticed is a simple matter of accounting. If the investment accelerator and exports amplifier operate (see Figures 4 and 5), the ratios of investment and exports to output decrease, and consequently the ratios of public expenditure and consumption must increase. The second factor refers to the institutional context in which the recession occurs. Due to income support programs, the fall in GDP may exceed the fall in households’ disposable income, so that consumption expenditure may be partly supported by the size of current transfers, such as unemployment insurance. For example, in the United States, according to

¹² The original argument of Pasinetti (1962) concerning the contrast between workers and rentiers may be extended to a contrast between poor and rich households. The propensity to consume may be different not only because of the difference in types of revenue (wages versus profits), but it may also be different because of the gap in the level of revenue (low wages versus high wages), particularly because the recipients of high wages tend to be the same ones who receive incomes in the form of dividend payments.

the AMECO database and our own calculations, the 2008–09 recession led to a contraction of 2.8% in GDP, while households’ gross disposable income only underwent a 0.4% drop, especially because of a 13.6% increase in current transfer received by households.¹³ Even in the United States, where the Welfare State is not as developed as in Scandinavian countries, automatic stabilizers are sufficiently effective to maintain the propensity to consume during recessions. These automatic stabilizer effects can be reinforced by expansionary discretionary fiscal policies. Thanks to these automatic stabilizers, consumption as a share of GDP is pulled upward, even in the absence of any behavioral modification to the propensity to consume from a theoretical point of view. If GDP falls more sharply than gross disposable income, consumption increases as a share of GDP, with no increase in consumption as a share of gross disposable income.

In addition, changes in behavior can also be expected to increase the propensity to consume during recessions. In the American institutionalist tradition, Frank, Levine, and Dijk (2014) underline the social norms underpinning consumption expenditures. Like Veblen (1899) and Duesenberry (1949), they posit that households engage in status’ competition that involves consumption expenditure. Lower-income households lacking the necessary incomes to consume “sufficiently” go into debt to keep up with the Joneses. When faced with recession, poor households can try to maintain their level of consumption despite depressed incomes, so leading to an increase in the propensity to consume. Cynamon and Fazzari (2008) report a similar process for upper-income households. This time, although recession still cuts incomes, these households manage to maintain their level of consumption (see Charles *et al.*, 2015) without going further into debt but through a drop in their propensity to save. Whether for lower- or upper-income households, van Treeck (2008) argues that consumption behaviors are

¹³ Current transfers received by households as a share of gross disposable income shifted from 16.79% in 2008 to 19.15% in 2009. It can be added that the share of current taxes on incomes and wealth fell from 12.77% in 2008 to 10.24% in 2009.

asymmetric with rising consumption when income rises, but not falling consumption when income falls.

But, there are also some behavioral arguments pointing to a decrease in the propensity to consume due to recession. The prospect of a prolonged recession depresses households’ optimism. Households may decide to save more out of fear of the future or simply out of caution. Or they may be compelled to save, if only in the form of reducing their debt levels, in the event of a debt crisis if banks become reluctant to lend to already over-indebted households.

Finally, in Table 4 we try to estimate what happened during the last great recession by computing the contributions of import and consumption propensities to increases in the multiplier.¹⁴ There is a wide variety of results depending on a variety of parameters (size of the country, absence of recession, sovereign default, initial level of saving rate, etc.) but it should be borne in mind that the multiplier is usually above unity. On average, the GDP growth rate is -5.4% and the multiplier increases from 1.144 to 1.226 (8% change). The table plainly displays the predominance of international trade. The propensity to import accounts for 80.7% of the multiplier growth rate between 2008 and 2009, while the propensity to consume accounts for just 19.3% of that growth.

Table 4: Contributions of propensities to import and consume to multiplier changes

Country	g		g_k		Contribution of import propensity to the change in k	Contribution of the propensity to consume to the change in k
	GDP growth rate (2008-2009)	k_{2008} Multiplier value in 2008	k_{2009} Multiplier value in 2009	Multiplier growth rate (2008-2009)		
Belgium	-0.026	0.801	0.845	0.055	0.775	0.225
Bulgaria	-0.050	0.970	1.084	0.118	1.086	-0.086
Czech Republic	-0.048	0.891	0.941	0.056	0.650	0.350
Denmark	-0.051	0.999	1.046	0.047	0.818	0.182

¹⁴ The impact of each propensity is found by taking the logarithm of $k = 1/(1 - c + m)$ and calculating its derivative with respect to time which gives: $\dot{k}/k = (\dot{c}/c)ck - (\dot{m}/m)mk$. For 2009, we then find:
 $(k_{2009} - k_{2008})/k_{2008} = (c_{2009}/c_{2008} - 1)c_{2008}k_{2008} - (m_{2009}/m_{2008} - 1)m_{2008}k_{2008}$.

Germany	-0.056	1.235	1.313	0.063	0.313	0.687
Estonia	-0.147	0.857	0.964	0.125	1.026	-0.026
Ireland	-0.064	0.761	0.777	0.020	0.896	0.104
Greece	-0.044	1.479	1.684	0.139	0.705	0.295
Spain	-0.036	1.380	1.471	0.066	1.005	-0.005
France	-0.029	1.359	1.430	0.052	0.513	0.487
Italy	-0.055	1.476	1.581	0.072	0.461	0.539
Cyprus	-0.020	1.075	1.143	0.063	1.563	-0.563
Latvia	-0.142	1.026	1.152	0.122	1.136	-0.136
Lithuania	-0.148	1.013	1.108	0.094	1.244	-0.244
Hungary	-0.066	0.812	0.858	0.058	1.012	-0.012
Netherlands	-0.033	0.851	0.877	0.030	0.797	0.203
Austria	-0.038	1.045	1.120	0.072	0.633	0.367
Poland	0.026	1.200	1.311	0.093	0.932	0.068
Portugal	-0.030	1.368	1.430	0.045	0.864	0.136
Romania	-0.071	1.329	1.398	0.052	1.573	-0.573
Slovenia	-0.078	0.858	0.966	0.125	0.627	0.373
Slovakia	-0.053	0.797	0.906	0.137	0.805	0.195
Finland	-0.083	1.114	1.205	0.082	0.551	0.449
Sweden	-0.052	1.026	1.100	0.072	0.602	0.398
United Kingdom	-0.043	1.508	1.570	0.041	0.679	0.321
Norway	-0.016	1.124	1.165	0.036	0.785	0.215
Switzerland	-0.021	1.016	1.045	0.028	0.322	0.678
United States	-0.028	2.065	2.184	0.058	0.690	0.310
Japan	-0.055	1.743	1.893	0.086	0.350	0.650
Average	-0.054	1.144	1.226	0.073	0.807	0.193

Source: Ameco and authors' calculations

Conclusion

Following the bursting of the housing market bubble and the financial turmoil of 2007–08, the world economy endured a generalized recession in 2009. Policymakers rediscovered the Keynesian recipes to avoid a complete economic collapse, and the downturn was contained in part by implementing modest expansionary fiscal policies. But fiscal policy was reversed too soon, and as early as 2010, policymakers reverted to fiscal tightening. Austerity policies were far harsher because policymakers listened to those economists who urged them to reduce public debt to avoid recession (Reinhart and Rogoff, 2010), and even claimed that austerity might be expansionary (Giavazzi and Pagano, 1990; Alesina and Perotti, 1995; Perotti, 2013). In Europe especially, austerity policies were widely implemented (*i.e.*, not only in the deficit

countries). The Troika (European Commission, European Central Bank, and International Monetary Fund) underestimated the effects of fiscal contraction on economic growth thereby causing tremendous social suffering: countries were persuaded to adopt such policies because they did not expect the impact of austerity measures to be as severe as it turned out to be. The valuation of the multiplier has been brought back to the core of economic policy debates (Blanchard and Leigh, 2013). What is at stake now is the overwhelming evidence that contractionary fiscal policies hurt growth, and may cause economic breakdown when implemented during economic slumps. In this paper we do not discuss precise values for multipliers or for the rate of change of the multiplier during cycles. We observe that the multiplier regularly increases during recessions, and we propose explanations for this change. First, our paper provides new evidence for this increased value of multipliers during recessions. Although our calculations are based on a very simple method that identifies a proxy for the multiplier rather than the true multiplier (see section 2), our work contributes to a reassessment of the need for counter-cyclical policies. Policymakers should avoid fiscal consolidation during recession because it would greatly impede economic growth and become partly self-defeating in achieving their budget target, and ultimately cause “pain without gain”. Despite its long decline, the multiplier value is still well above unity for many countries, and its increase during recessions supports the view that it should operate upwards rather than downwards.

Second, our paper provides explanations for these increases in multiplier value during recessions. Aftalion (1908)'s investment accelerator combined with large import contents for investment (theoretical method of Palley, 2009; empirical measures of Bussière *et al.*, 2011) explain the reduced propensity to import during recessions. Insights inspired by Pasinetti (1962)'s work on social groups' propensities to save are also needed to explain the increased propensity to consume. Future work needs to be done on this, such as a more detailed

investigation of the import content of aggregate demand (*i.e.*, isolate government investment expenditures; replicate the data for more recent years).

Third, and possibly most relevantly for economic policy, policymakers seeking to maximize their stimulus package during economic slumps should not try to enhance household consumption or firms' investment through tax cuts or other incentives. Instead they should favor government spending, since this type of aggregate demand has the lowest import content (see Table 3). The most effective stimulus plan would involve government consumption expenditure in areas such as health and education that would also benefit social welfare. Moreover, such plans coordinated among countries would be more effective. We clearly call for the implementation of stimulus plans in contracting economies. The need for change is simmering in Europe where inadequate macroeconomic policies have prompted rioting. The combination of fiscal contraction during recessions and the rigidity of European Monetary Union may remind economists of what they have forgotten.

However, we do not disregard the fundamental ecological constraint. We know that "growth as usual" is not even possible. But the lack of growth in the current context clearly reduces social welfare as it prevents useful investments that could engender efficiency improvements in technological processes. As underlined by Van den Bergh (2011, p. 882) de-growth or recessions "may depress investments in cleaner technologies, renewable energy and related research, which can lead to an increase in future CO₂ emissions. Even the short-term effect is uncertain, as production during a period of crisis may well shift to cheaper, dirtier techniques. Moreover, as is illustrated by recent events, both governments and firms are likely to pay less attention to environmental considerations and policies during a period of crisis." Like Pollin (2015), we would argue for investments in clean energy in particular. Implementing environmental policies in the current situation is liable to generate growth because some sectors of the economy will grow while others decline. Nevertheless, in the long run we

clearly accept the possibility of steady-state economies or de-growth situations (see for example Kallis et al., 2012, for an introduction to these concepts). After all, in Keynesian economics, growth is only a means by which to achieve the final goal of full employment. Shorter working hours are an alternative route to that same goal.

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Appendix: The divergence between marginal and average propensities to consume and between the "true" and our proxy multipliers

I. In normal times, when output rises, consumption rises, although not by as much. This is Keynes's fundamental psychological law which states that the marginal propensity to consume must range between 0 and 1.

$$\Delta Y > 0 \leftrightarrow \Delta C > 0 \text{ but } \Delta C < \Delta Y \leftrightarrow 0 < \frac{\Delta C}{\Delta Y} < 1$$

In our paper, we use average not marginal propensities. Accordingly, our multiplier values (k) move when consumption (or imports) as a share of output moves.

$$\text{if } \frac{C}{Y} \text{ moves then } k \text{ moves}$$

The next question deals with the factors determining the changes in average propensities. There are obviously biases stemming from the changes in the other components of aggregate demand as a share of output: consumption as a share of output may move because of variations in investment (or public spending, exports, imports) as a share of output, without any change in consumer behavior. This is just the changing structure of the economy. These matters concern the long period. But why does the average propensity shift from one period to the next? A first answer is that the average increases (respectively, decreases) when something larger (resp., smaller) than itself is added to it. In other words, the average propensity increases when the marginal propensity is larger than the average propensity,

$$\frac{C}{Y} \text{ increases if and only if } \frac{\Delta C}{\Delta Y} > \frac{C}{Y}$$

The change in a ratio is determined by the difference between the growth rate of the numerator and the growth rate of the denominator,

$$\frac{C}{Y} \text{ increases if and only if } \frac{\Delta C}{C} - \frac{\Delta Y}{Y} > 0$$

Mathematically, if output is on the rise ($\Delta Y > 0$) and consumption spending is positive ($C > 0$),

$$\frac{\Delta C}{C} > \frac{\Delta Y}{Y} \leftrightarrow \frac{\Delta C}{\Delta Y} > \frac{C}{Y}$$

Here, we merely allude to the reasons for the varying average propensities. But, for the theoretically-true multiplier, what is needed is an answer to the question of how the marginal propensities change. For the moment, thanks to the observed change in the average propensities, we only hint at the *level* of the marginal propensities compared to the previous level of average propensities: if the average propensity to consume increases, it is because the marginal propensity is larger than the average propensity, and consequently the proxy multiplier we build with the average propensity is an underestimation of the true multiplier based on marginal propensity. Conversely, when the average propensity to consume falls, marginal propensity is lower than average propensity, and therefore the proxy multiplier overstates the true multiplier. In short, the proxy multiplier understates the change undergone by the true multiplier resulting in smaller rises when the true multiplier is rising, and smaller falls when it is falling.

2. When output decreases, it may be assumed that consumption stagnates or increases only slightly. The theoretical explanations are based on consumption smoothing by the wealthy, or consumption fuelled by indebtedness. Another case is consumption supported by non-profit

institutions serving households (NPISHs), which can sustain household consumption despite falling income by means of donations. Another explanation is simply the role of automatic stabilizers: output falls and consumption rises, but it is because transfer incomes (for example, unemployment benefits) maintain households' purchasing power, with no fall in gross disposable income. This creates a puzzling case for Keynesians since the marginal propensity to consume out of gross domestic product becomes negative,

$$\Delta Y < 0 \leftrightarrow \Delta C > 0 \leftrightarrow \frac{\Delta C}{\Delta Y} < 0$$

It also leads to an increase in the average propensity to consume,

$$\Delta Y < 0 \leftrightarrow \Delta C > 0 \leftrightarrow \frac{C}{Y} \text{ increases}$$

Mathematically, it must be recalled that

$$\frac{C}{Y} \text{ increases if and only if } \frac{\Delta C}{C} - \frac{\Delta Y}{Y} > 0$$

This time, with a fall in output ($\Delta Y < 0$) and consumption spending still positive ($C > 0$),

$$\frac{\Delta C}{C} > \frac{\Delta Y}{Y} \leftrightarrow \frac{\Delta C}{\Delta Y} < \frac{C}{Y}$$

When output falls, a lower than average marginal propensity to consume leads to an increase in the average propensity. Since the marginal propensity is negative and the average propensity is necessarily positive, this will always be the case when output falls while consumption follows a positive growth rate. We will systematically have a growing average propensity. In terms of *level*, average propensity will always be higher than marginal propensity, so that our proxy multipliers will always be over-estimated compared to the true ones.

But, there is then room for average and marginal propensities to change in opposite directions. If the average propensity is necessarily oriented upwards in this case, it is likely that the marginal propensity is moving downwards, since it is now negative (which may not be a very common case). While our proxy multipliers would indicate an increase because of an enhanced average propensity to consume, the true multipliers would be declining because of a fall in the marginal propensity (such that the marginal propensity becomes negative).

The next question is do we encounter this case regularly in our database? In our sample, we count 165 cases of countries in recession over the period. But for these 165 cases of falling GDP, we have information about the gross disposable income for 112 cases only. Of these 112 recessions, we know that gross disposable income increase in 50 cases (automatic stabilizers), thus allowing for 24 cases of increased consumption (and 26 cases of decreased

consumption, presumably because of precautionary saving). Of the 112 recessions, we have 62 cases where the fall in GDP is accompanied by a fall in gross disposable income. In this sub-sample, we have 49 cases of decreased consumption, but 13 cases of increased consumption.

In the end, we have 37 cases out of 112 recessions where consumption increases, meaning that our proxy multipliers diverge from the true ones.

- For the 24 cases involving increased consumption thanks to increased gross disposable income, our proxy multipliers are responsible for basing the propensity to consume on GDP instead of on gross disposable income. But, we make our choice in order to draw on a larger database, including recessions before 1995 (gross disposable income data are unavailable prior to this date).

- For the remaining 13 awkward cases, a careful look shows that eight of them depend on the “thickness of the line”: the growth rates of consumption are not very far above zero and/or the growth rates of gross disposable income are barely below zero, and/or the GDP growth rates do not fall by much in recession. The remaining five cases are questionable. One is attributable to the simultaneous integration of households and non-profit institutions serving households (NPISHs) in our consumption measures (Ireland, 2010). When looking at household consumption alone, we see that consumption declines along with gross disposable income. The other four cases may be associated with countries experiencing credit bubbles (Sweden, 1981; Romania, 1998 and 2010; Latvia, 2010).

Although it takes us beyond the scope of this paper, we are dissatisfied with the work done in constructing our database. How can we define the marginal propensity to consume theoretically and how should we measure it empirically? With consumption smoothing during a recession, the marginal propensity to consume—defined as the increment in consumption divided by the increment in income—may become negative. Whereas consumption smoothing obviously indicates behavior designed to support consumption, it reduces the marginal propensity to consume, and consequently leads to a lower value for the multiplier. This conundrum forces us to consider that the marginal propensity to consume may be an asymmetric concept.

3. When output falls, it may also be assumed that consumption will fall, either because households are unable to smooth consumption because of budgetary constraints, or because

they are unwilling to do so due to pessimistic expectations about hard times continuing. This double drop (in consumption and output) brings the marginal propensity to consume back into positive territory,

$$\Delta Y < 0 \leftrightarrow \Delta C < 0 \leftrightarrow \frac{\Delta C}{\Delta Y} > 0$$

So an increase in the average propensity to consume depends on the same condition as above (in 2.): the marginal propensity should be lower than the average propensity.

$$\frac{C}{Y} \text{ increases if and only if } \frac{\Delta C}{C} - \frac{\Delta Y}{Y} > 0$$

Mathematically, if output falls ($\Delta Y < 0$) and if consumption spending is positive ($C > 0$),

$$\frac{\Delta C}{C} > \frac{\Delta Y}{Y} \leftrightarrow \frac{\Delta C}{\Delta Y} < \frac{C}{Y}$$

Once again, in terms of *level*, our average propensities are greater than the marginal ones. Consequently, our proxy multipliers are larger than the true ones. But, unlike the case of consumption smoothing where the average propensity to consume was necessarily oriented upwards, this time, the average propensity may rise or fall from one period to the next. If the average propensity falls, the marginal propensity is larger than the average propensity, and therefore our proxy multipliers are smaller than the true ones. Thus, there is no clear conclusion here about our over- or under-estimation of the true multipliers while using average rather than marginal propensities. Everything depends on what can be said of the change in average propensities.

Finally, one last case may arise when households decide to slash their consumption spending,

$$\Delta Y < 0 \leftrightarrow \Delta C < 0 \text{ but } \Delta C < \Delta Y < 0 \leftrightarrow \frac{\Delta C}{\Delta Y} > 1$$

This time, it is the other bound of Keynes’ fundamental psychological law that is overstepped. In this case, we are very likely to observe a fall in the average propensity to consume, since consumption as a share of GDP is very probably below 1. Our proxy multiplier value would record a drop because of the fall in the average propensity to consume, while the marginal propensity is very high, which may imply an increase in the true multiplier value (since the marginal propensity may not have been so high in the previous period).