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Secular Stagnation: Is Immigration part of the solution?*

José Alves† Sandro Morgado‡

Abstract

In our article we review the secular stagnation hypothesis, firstly postulated by Hansen (1939), to describe the current macroeconomic dynamics faced by developed economies. Based in the existing literature, we elaborate on a workable definition of secular stagnation founded on four pillars: diminished long run growth potential, increasing aggregate demand shortages, lowering of nominal short term interest rates and increasingly immovable unemployment. This four-pillar definition reveals a fundamental problematic faced by these economies; while a diminished long run growth potential, increasing aggregate demand shortages and an increasingly immovable unemployment stress the need for full employment policy measures, the lowering of nominal short term interest rates makes the mostly resorted to full employment policy measure, in the form of expansionary monetary policy, ineffective. This problematic implies an imperative rethinking of the policy framework in times of secular stagnation. For that, we consider one of the most evoked factors causing secular stagnation, demographics in the form of an aging population and a declining working age population, hence highlighting the pertinence of immigration as a possible solution. We do so by empirically observing the pillars of secular stagnation and testing the impact of demographic factors on those features, resorting to panel data analysis. Focusing on the EU15 and US economies, with data ranging from 1965 to 2020, we conclude that the four pillars we based our definition of secular stagnation upon can be empirically observed and that demographic factors play a statistically significant role for those determining features thus highlighting the pertinence of immigration as a possible solution.

KEYWORDS: Economic stagnation; secular stagnation; financial crisis; immigration; monetary policy.
JEL CODES: E52; G01; J11; O47

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1. INTRODUCTION

Financial crises and migration crises were among the top concerns of developed countries in pre-COVID19 world. On the one hand, the Global Financial Crisis (GFC) of 2007/2008 brought into question the distortions introduced by the growing relevance of the financial sector, while, on the other hand, the observed massive migration flows from different regions have increased disruptions within societies of developed economies.

Secular stagnation is neither a new nor a unanimous concept among economists. On its inception, secular stagnation was closely associated with the notion of economic maturity. The general idea being that since population growth stagnated and new investment opportunities ceased, economic activity would reach a stationary state corresponding to a situation of stagnation. Subjacent to this perspective lied the assertion that investment grows through capital widening and/or capital deepening, with the first occurring via increasing demand and the second via new technologies or ways of producing. Given a situation of a stagnated population growth (meaning stagnated demand) and a cessation of new investment opportunities (meaning a stagnation in new technologies or ways of producing), net investment stagnates, and the economy enters secular stagnation (Backhouse and Boianovsky, 2016).

By 1950 it became well established that the US was a mature economy but given the levels of prosperity witnessed at the time, the association between economic maturity and stagnation was lost and the concept of secular stagnation fell into oblivion. But does this mean Hansen (1939) was wrong and secular stagnation was nothing more than the projection of some economists' hypochondria? Certainly not. It only means that the assumptions upon which Alvin Hansen had based his analysis were drastically changed afterwards. As a matter of fact, the fundamental premise upon which Alvin Hansen had based his prediction for secular stagnation was shattered, as the post-war baby boom in the US resolved the underlying question of a stagnant population growth. And before the baby boomers entered the labour force, a period of outstanding public expenditure supported economic growth.

Given the controversy surrounding such topic, this article adopts a definition of secular stagnation that encompasses the different perspectives of some authors to have thought on the subject, the definition provided by Teulings and Baldwin (2014). According to this, secular stagnation is defined as an economic state characterized by

weak and anaemic recovery/expansion cycles and by self-feeding depressions, where sluggish economic growth emanates from the combination of a diminished long-run growth potential with persistent shortages of aggregate demand, resulting in a recurrent immovable unemployment that feeds further decreases in potential output and aggregate demand, setting a vicious cycle that pour into economic stagnation. This vicious cycle results from factors that simultaneously make monetary policy ineffective, as nominal interest rates are (asymptotically) binding at zero – the zero lower bond problem. From the above, we define secular stagnation as the result of four fundamental features – diminished long-run growth potential measured by potential GDP per capita, increasing aggregate demand shortages measured by the differential between GDP per capita and potential GDP per capita, one-off supply-side damage in the form of immovable unemployment fed by an off job skills depreciation and low and sticky nominal short term interest rates that make expansionary monetary policy ineffective (the zero lower bond problem).

The provided definition of secular stagnation holds a paradox that constitutes a fundamental problematic faced today by developed economies. On the one hand, because these economies are facing secular stagnation, they are experiencing a diminished long run growth potential, increasing aggregate demand shortages and recurrent immovable unemployment that emphasize the need for full-employment policy measures. On the other hand, exactly because developed economies are facing secular stagnation, the mostly resorted to full-employment policy measure, in the form of expansionary monetary policy, is ineffective given the zero lower bound problem. This paradox calls for an imperative rethinking of the policy framework in times of secular stagnation.

This study proposes to explore the different facets of this problematic, namely by suggesting a new approach in terms of policy framework, one that focuses on its fundamentals. Our main findings point to demographics significantly impacting secular stagnation, with a declining working age population leading to a diminished long run growth potential and an overall aging population negatively impacting aggregate demand, hence highlighting the pertinence of immigration as a possible solution in a context of secular stagnation. The empirical analysis conducted corroborates this pertinence by revealing that net migration significantly benefits aggregate demand, the unemployment rate and the nominal short term interest rate in a context of secular stagnation.

Our article is structured as follows. Section two reviews the relevant literature on the secular stagnation topic; Section three describes the data and methodology employed in our analysis; Section four provides the main findings of our research and, lastly, Section five presents the conclusions and policy implications of our study.

2. LITERATURE REVIEW

The revivalism of secular stagnation happened by the voice of Lawrence H. Summers at his 2013 IMF speech. Summers (2015) launched the secular stagnation hypothesis as the impossibility for developed economies to reach full-employment levels resorting to the "old monetary trickery" of lowering interest rates, due to what he perceived to be negative natural interest rates faced by such economies. Summers (2014) reaffirms the secular stagnation hypothesis as the impossibility to attain a full employment real interest rate (FERIR), introducing the zero lower bond problem as the result of nominal interest rates that are binding at zero, low inflation and unemployment. Moreover, Summers (2014) alerts for the association of low interest rates and expansionary monetary policy with financial instability. Two fundamental factors explain the lowering of the interest rates: a decrease in investment demand driven by slower population growth and by a technological progress that is less needy of physical capital, and a decrease in consumption driven by an increasing inequality that implies an income transfer from high propensity to consume agents to low propensity to consume ones. This demand side perspective is deepened in Summers (2015). Additionally, and as claimed in Summers (2016), fiscal policy is emphasized as a solution for secular stagnation from a demand side perspective.

Upon this revivalism of the secular stagnation hypothesis, Probst (2019) corroborates Summers' idea by underlining four fundamental causes and three main consequences of secular stagnation. According to him, a declining productivity growth, the falling price of investment goods and the growing digital economy, aging societies and increasing monopolization constitute the fundamental factors behind secular stagnation. The global decline in real interest rates, the increase in asset prices and private sector debt and rising inequality its consequences. By observing data on the real interest rates for the US from 1980 to 2012, Krugman (2014), by his side, concludes about a downward trend in real interest rates, agreeing with Summers on the pivotal relevance of

the zero lower bound problem for the current macroeconomic situation in developed economies. Krugman (2014) also hints about the linkage between secular stagnation (and a context of low interest rates) and financial crises, noticing the rise in leverage that preceded the financial crisis of 2007/2008, when household debt rose from 67% of GDP in 2001 to 94% in 2007, for the US economy. Finally, Krugman highlights working-age population growth dynamics as a particularly worrisome for the current macroeconomic picture among developed economies, indicating these values entered negative territory for the Eurozone and significantly dropped in the US. As allured by Summers and Krugman, the lowering of interest rates and consequent zero lower bound problem constitute a fundamental feature of secular stagnation. This is corroborated by Blanchard et al. (2014), who concludes that the lowering of real interest rates is bad for monetary policy but good for fiscal policy, highlighting the pertinence of expansionary fiscal policy in a context of secular stagnation. Caballero and Farhi (2014) flow in the same direction by setting a simple model to analyse the demand and supply of safe assets, arguing that there is a shortage of safe assets that is behind the lowering of interest rates observed by the evolution of the three-month real interest rate and the ten-year real interest rate for the US economy, from 1990 to 2012.

As previously mentioned, the concept of secular stagnation is not unanimous, and even those who agree with this hypothesis might disagree on its very nature. That is the case of Gordon (2014) who puts the onus of such stagnation on the supply side of the production function, claiming for structural reforms as an answer to secular stagnation. Raising retirement age in line with life expectancy, raising immigration quotas, freeing non-violent offenders and adopting a new model for financing education constitute the policy measures suggested by Gordon to fight his supply side secular stagnation. Even though emphasizing supply side factors, it seems clear that some of these are transversal to the explanation of secular stagnation either from a supply side perspective or from a demand side one. An aging population is a factor for the decrease in labour participation as it is for a decrease in investment demand. And even those factors who seem to be originated from one side of the equation end up impacting on the other side of the production function. Inequality may be explained by the supply side behaviour of corporations, but its impact is felt on the demand side via a decreasing consumption. Perhaps acknowledging this, Gordon (2015) ends up conceding that “in the end, secular

stagnation is not about just demand or supply but also about the interaction between demand and supply". This conciliatory perspective seems to be shared by Blecker (2016), who enumerates both demand side and supply side factors to explain the secular stagnation trend inferred by its analysis on the average annual growth rates of US GDP for the last four business cycles.

Depending on if one views secular stagnation as demand sided or supply sided, the policy measures proposed in a context of secular stagnation vary. Buchner (2020) highlights the pertinence of expansionary fiscal policy in a context of secular stagnation. In an environment of persistent low interest rates, expansionary fiscal policy and sustainability of public finances no longer must be looked at as a trade-off. Traditionally, expansionary fiscal policy is regarded as a debt increasing tool for employment but in a scenario where GDP grows faster than debt, this macroeconomic paradigm changes. Wolff (2014), on the other hand, worries that little importance might be being given to the real factors causing secular stagnation. Even though recognizing there is a role for monetary policy and fiscal policy to play, the author reminds that if the stagnation in developed economies is permanent, structural policies must necessarily be implemented.

But not everyone agrees to the secular stagnation hypothesis. A rationale of refusal that seems to have gathered a significant share of supporters regards the argument involving technological progress, with the advocates of such rationale coming to be known as tech optimists. Eichengreen (2014) refutes both the demand side and supply side perspectives of secular stagnation by stating that, like in the past, new inventions, on fields like artificial intelligence or human genome, take time to produce their effect on productivity but as soon as they do, it will make no sense talking about a secular stagnation in productivity leading to a diminished long run growth potential. The author also discredits the aggregate demand perspective by stating that interest rates are not helplessly low given they are determined in international global savings market and in that market, there is no imbalance between the supply and the demand schedule of loanable funds. Eichengreen (2015) empirically corroborates this perspective by analysing data on the secular trend in global savings rate. This technological optimism is shared by Mokyr (2014) who, even though recognizing the negative impact of a declining working age population and inequality on economic growth, argues that the outstanding pace of today's technological progress in areas like computing, materials and genetic

engineering will prove secular stagnation advocates wrong. Glaeser (2014) reminds us that in previous periods economic growth also showed sluggish patterns, but history ended up showing that it did not mean a permanent stagnation. According to him, two key factors for long term growth, namely innovation and investment, do not show any signs that might suggest a secular stagnation. Ramey (2020) analyses secular stagnation from a supply side perspective and according to her, two fundamental factors explain the slow growth in potential GDP: slow population growth and slow labour productivity growth. The author believes, though, that the great innovations of today will resolve the issue regarding the latter, noticing that great technological revolutions take their time to impact productivity, therefore we may not be facing secular stagnation but only a technological lull. But secular stagnation scepticism does not derive exclusively from a tech optimism perspective. Koo (2014) argues that developed economies are going through a balance sheet recession and not secular stagnation. According to him, as banks write off bad loans and people pay down their debt, a deleveraging process takes place, and it is this deleveraging that explains the anaemic recovery and sluggish economic growth evidenced by developed economies in the aftermath of the global financial crisis of 2007/2008.

Amidst such controversy, the urge to model the secular stagnation hypothesis was inevitable. Eggertsson and Mehrotra (2014) were the first responding that urge. They formalized the secular stagnation hypothesis by setting a simple overlapping generation (OLG) model where a slowdown in population growth, increasing inequality, and the tightening of limits on borrowing lead to a decrease in the equilibrium real interest rate. In this secular stagnation model, the return to positive steady-state values does not occur. Instead, a deleveraging shock accentuates the downward trend in the real interest rate that becomes permanently negative e. Eggertsson et al. (2016) set an extension of the previous OLG model to assess the policy implications of secular stagnation in an open economy in the context of a textbook IS-MP model. Considering the case for an open economy only reinforces the pertinence of fiscal policy in a context of secular stagnation. Eggertsson et al. (2019) set an OLG model to, qualitatively and quantitatively, evaluate the contributions of demographic and technological factors for the decline in interest rates since 1970, while at the same time quantifying changes required to attain higher rates. The main implication of the model is that permanently low interest rates can, indeed, lead

to a situation of secular stagnation defined by a permanent output slump, the zero lower bound problem and below the target inflation. The changes required to attain higher interest rates imply non-consensual policy measures, such as higher inflation targets, persistent increases in debt-to-GDP ratios and more robust and "generous" social security schemes. The uncertainty about secular stagnation then poses a real challenge for policy makers as the policy recommendations in times of secular stagnation might be considered nefarious in normal times and policy measures of normal times ineffective and unsustainable within a context of secular stagnation. The aforementioned unsustainability derives from the financial instability that is associated with expansionary monetary policy in a context of secular stagnation. This association is deepened by Bresser-Pereira (2019) who argues capitalism has morphed itself from an entrepreneurial capitalism into a technobureaucratic capitalism, i.e., it passed from a productivity capitalism to a financier rentier capitalism, that will, in the end, lead to a higher propensity to financial instability.

Another aspect that seems transversal to the secular stagnation hypothesis lies on the demographic factor. On this subject, Acemoglu and Restrepo (2017) point to a positive and statistically significant correlation between an aging population and economic growth, contradicting the argument that places demographics as a fundamental factor for secular stagnation. In fact, this panel data analysis suggests that it is exactly countries where aging is more pronounced who have shown higher GDP per capita growth rates. These authors argue that an explanation for these results resides on the fact that these aging economies feel more pressured to adopt new technologies, increasing technological progress and productivity. This explanation exacerbates the substitution effect between technology and labour in detriment of its complementary effect. Eggertsson et al. (2019), adopting the same methodology and data, arrive at entirely different conclusions, under a variety of empirical specifications. These conclusions support the secular stagnation hypothesis by highlighting a declining population growth as a fundamental factor. These authors state that Acemoglu and Restrepo (2017)'s conclusions are correct when applied to classical economies. However, when applied to secular stagnation economies that hit the zero lower bound problem, the sign of the correlation between aging population and GDP per capita inverts, passing from positive to negative. Ferrero et al. (2019) focus their analysis on the negative impact of demographics on the lowering of interest rates, presenting two theoretical arguments to

explain this negative correlation. First, aging implies the need for more savings to spend in retirement leading to an increase in savings, i.e., the supply of loanable funds. Second, a declining working age population means that the physical capital left available by those who retire gradually becomes more than enough for those who enter labour force, leaving no need for capital widening and thus inducing a decrease, or at least, a stagnation in investment demand. This argument exacerbates the complementary effect between labour and capital in detriment of its substitution effect.

From the reviewed literature, we retain two relevant aspects for our exposition. First, in a context of secular stagnation the use of conventional monetary policy not only reveals itself ineffective given nominal interest rates that are binding at zero but also leads to financial instability. Second, demographics, in the form of an aging population and a declining working age population, seems to negatively impact GDP per capita, potential GDP per capita and the interest rate, constituting in that way a fundamental and transversal factor for secular stagnation. Even though the allusion to financial instability in a context of secular stagnation seems omnipresent in the reviewed literature, this association is predominantly derived from an environment of low interest rates, which constitutes only one feature of secular stagnation. Also, financial instability does not necessarily imply financial crises. This article though defends a stronger, deeper, endogenous like relation between secular stagnation and financial crises, one that is derived by Hyman Minsky's theory (Minsky et al, 1960). According to this, during expansion cycles banks become more willing to grant loans, with reduced spreads, leading to businesses and households becoming also more willing to contract new loans and, in this way, increasing the indebtedness levels in the economy. But as the cycles of expansion approach full employment levels and inflationary pressures arise, monetary authorities are forced to intervene by raising interest rates. Such increase pressures highly indebted businesses and households as it aggravates their debt instalments-to-income ratios, eventually leading to some defaults. And as banks are remembered of bad times, they panic and react to this panic by making big credit cuts – the Minsky moment – with these cuts reducing the financial liquidity required by businesses to pay their suppliers and their workers. The drying of these liquidity flows plunges the economy into a recessive spiral made of bankruptcies and unemployment. After the economy enters a recession and deflationary pressures arise, monetary authorities then decrease nominal

short-term interest rates, stimulating a new expansion cycle that reinitiates the whole process described by Minsky.

Our article argues that Minsky's explanation of financial crises is only valid because these economies are facing secular stagnation. A key aspect of this explanation consists of how the withdrawal of the monetary stimulus when facing inflationary pressures leads to defaults of highly indebted entities that trigger the whole recessive spiral that characterizes these financial crises. This happens because the rise in interest rates leads to an increase in the debt instalments of highly indebted entities deteriorating their debt-to-income ratios and consequently triggering the defaults that are at the root of such "Minskian" financial crises. The deterioration of the debt-to-income ratios only takes place because we are facing secular stagnation. Otherwise, and from a dynamic perspective, even after the withdrawal of the monetary stimulus, one should expect income to keep increasing which would imply the raising numerator in the debt-to-income ratio to be met by a compensating raising denominator, meaning no deterioration of the debt-to-income ratios and no defaults. This dynamic view is in fact at the core of the idea of monetary policy as a business cycle smoothing policy tool and is then valid if employed to deal with temporary shocks in the economy. But secular stagnation is no temporary shock, is a permanent long-lasting event. This means that when the monetary stimulus is withdrawn, instead of income keeping increasing it stagnates or decreases because secular stagnation and its headwinds keep lingering in the economy. This stagnated or decreased income does not compensate the increasing debt instalments resultant of rising interest rates, leading to the deterioration of debt-to-income ratios and consequent defaults that are at the root of financial crises. And that is why the repeated use of monetary policy within a context of secular stagnation is inducing of financial crises. Hence the linkage between financial crises and secular stagnation.

The unsustainability of monetary policy within a context of secular stagnation results, then, from the inadequacy of employing a policy measure conceived to deal with temporary shocks in the context of a long-lasting event. Given this unsustainability results from the aforementioned temporal inadequacy it would be theoretically incoherent from our part to agree with those who defend expansionary fiscal policy as the primordial response to the secular stagnation problematic. Instead, this study considers that the rethinking of the policy framework in times of secular stagnation must necessarily involve

structural policy measures that impact the factors causing the problem they intend to tackle. And if there is a transversal and fundamental factor causing secular stagnation, that is demographics, with an aging population and a declining working age population, with immigration inevitably emerging as a possible solution.

3. METHODOLOGICAL APPROACH

Our empirical analysis focuses on the causality between demographic factors and secular stagnation. Therefore, we pay particular attention to previous empirical work focusing on that causality. From the contraposition of Eggertsson et al. (2019) to Acemoglu and Restrepo (2017) we retain that it is crucial to insightfully choose the countries entering our sample. In fact, we do not claim secular stagnation to be a reality among all countries but only among developed economies. But what do we consider as developed economies? From the reviewed literature, it becomes apparent that the secular stagnation discussion is centred around the American and European economies. Summers (2015) tells us that "The experience of Japan in the 1990s and now that of Europe and the United States suggests the need for theories that explain a more important and troubling phenomenon…", outlying secular stagnation as a present American and European reality as it was for Japan in the past. Krugman (2014) corroborates this idea by highlighting the demographic factor as a particularly worrisome for the American and European economies – "…Hansen's old concern – slow population growth – is back. It's not widely recognised just how quickly the demography of growth has changed in western economies. It's most dramatic in the Eurozone (…) which has moved rapidly into negative, almost Japanesestyle territory. But the US has also seen a sharp drop.".

We then consider for our sample the American and European economies. But for the European economies, instead of the nineteen-euro area countries analyzed by Ferrero et al. (2019) we propose the Europe of the fifteen (EU15). In accordance to this, our database comprises the following economies: Austria (AUT), Belgium (BEL), Denmark (DNK), Finland (FIN), France (FRA), Germany (DEU), Greece (GRC), Ireland (IRL), Italy (ITA), Luxembourg (LUX), the Netherlands (NLD), Portugal (PRT), Spain (ESP), Sweden (SWE), the United Kingdom (GBR) and the United States (USA). This delimitation of the european economies to the EU15 is justified by two reasons. The secular stagnation phenomena emanates from a socio-cultural matrix corresponding to a

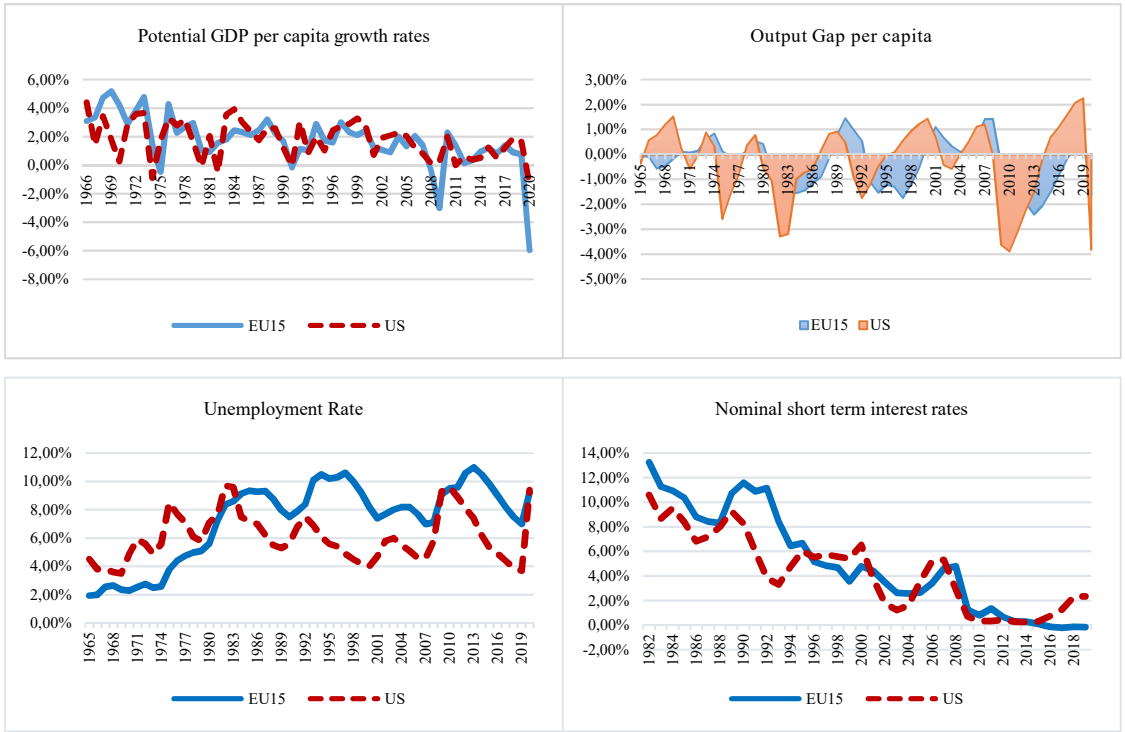
certain capitalistic modern way of living, something visible in what Gordon (2015) denounces as a socioeconomic decay. And it is that "way of living" that leads to the societal features that end up constituting the roots from which secular stagnation blossoms. We consider that delimiting the european economies in our sample to the EU15 constitutes a better representation of this socio-cultural matrix than considering the euro area countries, as the United Kingdom, Sweden and Denmark have certainly been more exposed to this capitalistic modern way of living than countries like Slovenia, Cyprus, Malta, Slovakia, Estonia, Latvia and Lithuania. Another reason for this choice resides on the temporal range of data available. Because we are talking a secular trend, we intend to have the widest temporal range possible. Taking into consideration the empirical work of Ferrero et al. (2019) we cannot but wonder if data ranging just from 1990 is not somehow restrained by the inclusion of former soviet states in the sample.

In conclusion, our data concerns the EU15 and the US economies ranging from 1965 to 2020. We also present estimation results for the sub-periods ranging from 1990 to 2020 and from 2008 to 2020. We test for the sub-period of 1990-2020 to get a base of comparison between our countries' sample and that of Ferrero et al. (2019)'s and test for data ranging from 2008 to 2020 as proposed by Eggertsson et al. (2019). Finally, we test for the period considered, from 1965 to 2020, only for the EU15 economies to assess the claim that secular stagnation is more likely to be a European reality rather than an American one.

The mere observation of data for the EU15 and US ranging from 1965 to 2020, in Figure 1, suggests that secular stagnation is indeed a reality among developed economies. The downward trend in potential GDP per capita growth rates suggests a diminished long run growth potential for these economies. And not only potential GDP per capita growth has diminished but actual GDP per capita growth decreased even more, as suggested by the increasing negative output gaps given by the differential between GDP per capita and potential GDP per capita. The upward trend in the unemployment rate and the downward trend in the nominal short term interest rate complete the secular stagnation illustration for these economies. A fundamental feature regarding secular stagnation concerns the zero lower bond problem, in which the lowering of nominal short term interest rates to near zero values makes monetary policy ineffective. We argued that not only monetary policy is ineffective but also its repeated use in a context of secular stagnation is inducing

of financial crises. The ineffectiveness and unsustainability of monetary policy within a context of secular stagnation are of the utmost importance for the secular stagnation discussion as they allow us to infer about the temporal inadequacy of employing policy measures conceived to deal with temporary shocks in a context of a long-lasting event. This permits us to channel our proposition for the imperative rethinking of the policy framework in times of secular stagnation somewhere else, namely towards structural policy measures that impact the factors causing this stagnation. Among these, the demographic factor gets ubiquitously evoked as a particularly transversal and impactful one, hence highlighting the pertinence of immigration as a potential policy measure.

Figure 1 – Potential GDP per capita at constant prices, Output Gap per capita, Unemployment Rate and Nominal Short Term Interest Rates



Source: AMECO.

The empirical work conducted obeys to this logical inference. Therefore, we empirically assess the four features of secular stagnation by analysing the contribution of the factors enumerated in literature review, focusing on the demographic factors presented as well as assessing the impact of net migration on those features. We do so by setting the following equations in a panel data framework:

(1) $\mathrm{PotGD}P_{i,t} = \beta_{0,i,t} + \gamma.\mathrm{WA}P_{i,t} + \eta.\mathrm{H}C_{i,t} + \delta.\mathrm{NFC}F_{i,t} + \psi.\mathrm{PA}T_{i,t} + \theta.\mathrm{TF}P_{i,t} + \tau.\mathrm{NetMi}g_{i,t} + \eta_t + \nu_i + \varepsilon_{i,t}, \mathrm{t} = 1, \dots, \mathrm{T}; \mathrm{i} = 1, \dots, \mathrm{N},$

(2) $\mathrm{GA}P_{i,t} = \beta_{0,i,t} + \chi.\mathrm{Youngi}, \mathrm{t} + \phi.\mathrm{Old}_{i,t} + \kappa.\mathrm{GIN}I_{i,t} + \tau.\mathrm{NetMi}g_{i,t} + \eta_t + \nu_i + \varepsilon_{i,t}, \mathrm{t} = 1, \dots, \mathrm{T}; \mathrm{i} = 1, \dots, \mathrm{N},$

(3) $\Delta U_{i,t} = \beta_{0,i,t} + \omega.U_{i,t-1} + \rho.\Delta\mathrm{Empl}_{i,t} + \varsigma.\mathrm{H}C_{i,t} + \mu.\mathrm{g}.\mathrm{AgWA}P_{i,t} + \alpha.\mathrm{GD}P_{i,t} + \tau.\mathrm{NetMi}g_{i,t} + \eta_t + \nu_i + \varepsilon_{i,t}, \mathrm{t} = 1, \dots, \mathrm{T}; \mathrm{i} = 1, \dots, \mathrm{N},$

(4) $i_{i,t} = \beta_{0,i,t} + \gamma.\mathrm{WA}P_{i,t} + \eta.\mathrm{H}C_{i,t} + \delta.\mathrm{NFC}F_{i,t} + \psi.\mathrm{PA}T_{i,t} + \theta.\mathrm{TF}P_{i,t} + \chi.\mathrm{Youn}g_{i,t} + \phi.\mathrm{Old}_{i,t} + \kappa.\mathrm{GIN}I_{i,t} + \tau.\mathrm{NetMi}g_{i,t} + \eta_t + \nu_i + \varepsilon_{i,t}, \mathrm{t} = 1, \dots, \mathrm{T}; \mathrm{i} = 1, \dots, \mathrm{N},$

where subscripts *i* and *t* denote, respectively, the country and time dimensions; η_t and $\nu_i$are respectively, the time effect and the country-specific effect; $\varepsilon_{i,t}$ is an unobserved zero mean white noise-type column vector satisfying the standard assumptions.

Equation (1) assesses the first pillar of secular stagnation, namely the diminished long run growth potential measured by the natural logarithm of potential GDP per capita at constant prices. For that, we consider the neoclassical aggregate production function given by *Y = AF(K, L)*, where *Y* is the aggregate output, *K* is the capital stock (both human and physical), *L* is the labour force and *A* designates technological progress or productivity. Data regarding working age population represents *L*, net fixed capital formation and the human capital index stand for physical and human capital respectively and total factors productivity for A. The variable regarding patent applications is pertinent from the perspective of the technological discussion presented in the literature review, where tech optimists argue the innovations of our days will solve the underlining question of slow growth and pessimists state that today's innovations do not impact productivity as others in the past did.

Equation (2) empirically verifies the second pillar of secular stagnation in the form of increasing aggregate demand shortages, measured by the output gap per capita. From the reviewed literature, two fundamental factors are evoked when making the case for a

demand-side secular stagnation: an aging population and inequality. Accounting for the inequality argument, we include the pre-tax Gini coefficient and regarding an aging population, we consider the dependency ratios as proposed by Ferrero et al. (2019).

The third pillar of secular stagnation, represented in Equation (3), concerns the one-off supply side damage. This feature tells us that longer spells in unemployment, due to anaemic recovery expansion cycles and self-feeding depressions that characterize secular stagnation, lead to an off-job skills depreciation that ends up constituting itself an impediment for the re-entrance in the labour market of these unemployed, thus constituting itself a factor for the increasing and seemingly immovable unemployment rates. We state that demographics, and an aging working age population, might also play a role in this off-job skills depreciation as an older unemployed might find it more difficult to keep up with the requirements of today's pressing technological pace of available job opportunities, making it even more difficult to re-enter employment. Accordingly, the equation that empirically verifies the one-off supply-side damage includes the human capital index and the dummy variable $g.AgWAP$ to assess that effect. It assumes the value of 1x $AgWAP$ when the economy is in an expansion cycle defined by a positive growth rate of GDP per capita at constant prices (g) and 0 otherwise. $AgWAP$ gives us the aging of the working age population as a weighted average of age groups in such sample.

The lowering of nominal short term interest rates constitutes a fundamental feature of secular stagnation. In this paper, we claim this lowering to be endogenous to secular stagnation. Therefore, equation (4) includes as explaining variables for the lowering of nominal short-term interest rates all variables used to explain secular stagnation from a supply and a demand side in equations (1) and (2) respectively.

Our data is retrieved from multiple sources. From AMECO database we retrieved the potential GDP at constant prices (*PotGDP*) and the GDP at constant prices (*GDP*) to compute the output gap (*GAP*), net fixed capital formation at constant prices per capita (*NFCF*), total factors productivity (*TFP*), the unemployment rate in percentage of the active population (*U*), the employment rate in percentage of working age population (*Empl*) and the nominal short term interest rate (*i*). From World Development Indicators we make use of total population, working age population on total population (*WAP*), total population aged between 15 and 64 years old, patent applications per million of

inhabitants (*PAT*), Young (*Young*) and Old (*Old*) dependency ratios and net migration measured in hundreds of thousands[4] (*NetMig*). Moreover, human capital index (*HC*) and pre-tax GINI coefficient (*Gini*) variables are from Penn World Table and World Inequality Database, respectively. Lastly, in Appendix we provide summary statistics and correlation matrix tables.

The estimation of the parameters for each equation will allow us to analyse the impact of the demographic factor for secular stagnation thus enabling us to conclude about the pertinence of immigration as a plausible policy measure within such context. To do so, we estimate parameters resorting to panel data techniques. As our panel is featured by $T>N$, we firstly compute the unit roots for each time series, presented in Appendix. Moreover, we decided to resort to OLS-FE estimator, after running Lagrange Multiplier and Hausman tests[5]. Additionally, and since cross-sectional dependence is a main issue of panels with long time series, we have decided to test it resorting to Pesaran (2021) test. As we conclude for the presence of cross-sectional dependence we then resort to Driscoll and Kraay (1998) estimator with robust standard errors, which also allow for correcting possible endogeneity problems.

4. Empirical Analysis

4.1 – Diminished long run growth potential

As previously stated, our empirical analysis focuses on the impact of demographic factors on the four features of secular stagnation. Regarding the diminished long run growth potential measured by the variation of potential GDP per capita, the independent variable on focus is *WAP*. We also estimated the models with and without the independent variable *NetMig* to assess the impact of net migration on the four features from which secular stagnation arises. Looking at the estimation results presented in table 1, we conclude *Netmig* not to be statistically significant in explaining the diminished long run growth potential.

[4] Because data for *NetMig* is only available in five year periods, we consider annual data for net migration as the annual average of the ~~previous~~/respective five year period.

[5] We have also test run Modified Wald and Breusch-Pagan LM tests for assessing heteroskedasticity and autocorrelation. For reasons of parsimony, we do not provide those results. However, they are fully available upon request.

Table 1 – Results of potential GDP per capita, 1965-2020

	All countries		EU-15		From 1990		From 2008	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WAP	0.198***	0.197***	0.205***	0.188***	0.182**	0.220**	-0.130	-0.047
	(0.042)	(0.058)	(0.031)	(0.046)	(0.086)	(0.084)	(0.079)	(0.083)
HC	-0.038***	-0.039***	-0.045***	-0.046***	-0.038***	-0.045***	0.024***	0.014
	(0.008)	(0.010)	(0.009)	(0.010)	(0.013)	(0.016)	(0.007)	(0.010)
NFCF	0.000	0.000	0.000	0.000	0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PAT	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	0.000*	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TFP	0.003***	0.003***	0.003***	0.003***	0.003***	0.002***	0.001**	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
NetMig		-0.000		0.001		0.000		-0.001
		(0.000)		(0.001)		(0.001)		(0.000)
Observations	569	537	530	500	421	389	166	134
R-squared	0.587	0.576	0.667	0.662	0.570	0.554	0.890	0.887

Note: Robust standard errors clustered at the country level are reported in parenthesis. Constant term and country and time effects estimated but omitted for reasons of parsimony. *, **, *** denote significance at 10, 5 and 1% levels.

The *WAP*, though, is significant for the overall period and for the period ranging from 1990 to 2020. The positive sign associated with its coefficient suggests that, indeed, a declining working age population constitutes a factor for a diminished long run growth potential, as a 1 p.p. decline in the working age population induces a negative variation in potential GDP per capita of 0.198% (0.197% considering the net migration impact), for the EU15 and US for the period considered. The fact that this variable loses its statistical significance for the sample ranging from 2008 might be explained by the magnitude of the events that unfolded from that period, with the global financial crisis and its impactful ramifications possibly clouding and diluting the contribution of other factors for the variation of potential GDP per capita.

4.2 – INCREASING AGGREGATE DEMAND SHORTAGES

Regarding the second pillar of secular stagnation, figure 1 suggests that aggregate demand shortages have become more expressive throughout the period considered. In the literature review, we identified, among others, two factors frequently evoked to explain secular stagnation from a demand side perspective: an aging population and increasing inequality. By looking at table 2, that depicts the results of the estimation of equation (2), once again the demographic factor prevails as an explaining variable for the increasing aggregate demand shortages illustrated in figure 1.

Table 2 – Results of output gap per capita, 1965-2020

	All countries		EU-15		From 1990		From 2008	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young	-0.048	-0.041	-0.050	-0.030	-0.013	0.040	0.311***	0.405*
	(0.056)	(0.055)	(0.054)	(0.053)	(0.075)	(0.091)	(0.041)	(0.208)
Old	-0.174*	-0.202*	-0.178*	-0.215*	-0.134*	-0.350***	0.125	0.318**
	(0.095)	(0.114)	(0.090)	(0.108)	(0.080)	(0.111)	(0.082)	(0.113)
GINI	-0.107	-0.100	-0.092	-0.090	-0.112	-0.116	-0.089	0.172
	(0.131)	(0.135)	(0.137)	(0.141)	(0.240)	(0.161)	(0.392)	(0.232)
NetMig		0.003**		0.004**		0.006***		0.003
		(0.001)		(0.002)		(0.001)		(0.002)
Observations	654	622	600	570	464	432	176	144
R-squared	0.468	0.484	0.488	0.513	0.040	0.527	0.068	0.059

Note: Robust standard errors clustered at the country level are reported in parenthesis. Constant term and country and time effects estimated but omitted for reasons of parsimony. *, **, *** denote significance at 10, 5 and 1% levels.

While the explaining variable *GINI* is not significant in explaining the increasingly negative output gaps per capita, the *Old* variable evidences statistical significance for the overall period and for the period ranging from 1990 to 2020. The negative sign of this coefficient corroborates the conclusions derived by the empirical work of Eggertsson et al. (2019) about the negative impact of an aging population on aggregate demand. Considering the EU15 and US economies for the period considered, when the old dependency ratio (*Old)* increases by 1 p.p., the differential between GDP per capita and potential GDP per capita (*GAP)* decreases 0.17 p.p. (0.20 p.p. considering the impact of net migration). Once again, though, for the sample ranging from 2008*, Old* loses its statistical significance or inverts its sign from negative to positive, with the same rationale concerning the turmoil that unfolded during this period applying to explain this abnormal statistical inference.

Contrary to equation (1), the independent variable *NetMig* is significant in explaining the output gaps for the period considered. The positive sign of the coefficient tells us the bigger the influx of immigrants (compared to the outflow of emigrants) the bigger the difference between GDP per capita and potential GDP per capita at constant price. And taking into account that *NetMig* is not significant in explaining variations in potential GDP per capita, as assessed by the estimation of equation 1, we conclude that a positive variation in net migration positively impacts aggregate demand. More precisely, for the EU15 and US economies for the period considered, a positive variation of one hundred thousand migrants increases the differential between GDP per capita and potential GDP per capita in 0.3 p.p.

4.3 – ONE-OFF SUPPLY-SIDE DAMAGE

The one-off supply-side damage is a feature of secular stagnation according to which there is a trace of unemployment derived from recessions that is not recovered during expansion cycles. To assess if this trace of immovable unemployment is in part the result of an off-job skills depreciation we included in equation (3) the human capital index *(HC)* as an explaining variable. And to test if demographics might explain this off-job skills depreciation we consider the dummy variable *g.AgWAP*. The results of the estimation of equation (3) are presented in table 3.

Table 3 – Results of variation in the unemployment rate, 1965-2020

	All countries		EU-15		From 1990		From 2008	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
U	-4.237**	-4.677**	-4.336**	-2.457	-7.089**	-8.242**	-2.115	-0.877
	(2.000)	(2.072)	(2.090)	(1.524)	(2.826)	(3.312)	(3.443)	(3.830)
HC	0.286	0.371	0.224	-0.040	0.216	0.650	-0.076	-0.005
	(0.381)	(0.448)	(0.393)	(0.079)	(0.995)	(1.572)	(0.182)	(0.273)
Δ*Empl*	-0.352***	-0.342***	-0.337***	-0.396***	-0.317*	-0.282	-0.754***	-0.780***
	(0.123)	(0.124)	(0.126)	(0.111)	(0.184)	(0.188)	(0.058)	(0.057)
GDP	-5.152*	-5.340**	-5.342**	-5.891**	-9.040**	-9.697**	-6.937	-7.018
	(2.574)	(2.542)	(2.581)	(2.518)	(3.951)	(4.501)	(5.544)	(6.085)
g.AgWAP	-0.015***	-0.013***	-0.013***	-0.017***	-0.015***	-0.013***	-0.012*	-0.010
	(0.003)	(0.004)	(0.003)	(0.005)	(0.004)	(0.004)	(0.005)	(0.006)
NetMig		-0.087***		-0.042		-0.121***		-0.031*
		(0.030)		(0.044)		(0.041)		(0.014)
Observations	864	832	810	780	464	432	176	144
R-squared	0.579	0.579	0.570	0.483	0.623	0.627	0.741	0.742

Note: Robust standard errors clustered at the country level are reported in parenthesis. Constant term and country and time effects estimated but omitted for reasons of parsimony. *, **, *** denote significance at 10, 5 and 1% levels.

The independent variable *HC* is not significant thus contradicting the rationale according to which increasing unemployment might be explained by an off-job skills depreciation. This lack of significance of human capital in explaining variations in the unemployment rate submits us to the exposed by Gordon (2015) regarding the changes in the impact of education on productivity since 1970, the period from where our data roughly ranges. The *g.AgWAP* variable is found to be significant for the period considered as well as for the period ranging from 1990 to 2020 but does not show the expected sign. This means that an aging working wage population contributes to a decrease in the unemployment rate, which is contrary to what we are trying to prove. This contradicting result might be explained by how this dummy variable was constructed. By giving us the aging of the working age population only for periods when the growth rate of GDP per capita (g) is positive and 0 otherwise, this variable holds two contradicting effects: on the one hand, the aging of working age population is expected to increase the unemployment rate, thus a positive sign for the coefficient should be expected; but on the other hand, a

positive growth rate of GDP per capita (g) is expected to decrease the unemployment rate, thus a negative sign should be expected. Since the estimates of *g.AgWAP* show a negative sign, one might conclude that the second effect, the effect of a positive variation in GDP per capita prevails and that effect is significant for the entire period considered and for the period ranging from 1990 to 2020. This conclusion is corroborated by the estimation results for the independent variable *GDP* that show a negative and significant sign for the overall period considered and for the period ranging from 1990 to 2020, signifying that a positive variation in GDP per capita leads to a negative variation in the unemployment rate, as expected. So, even though equation (3) does not directly include a demographic factor that is significant in explaining an increasing unemployment, indirectly this demographic factor is present given the working age population and the old dependency ratio negatively impact potential GDP per capita and GDP per capita respectively, as previously shown by the estimation of equations (1) and (2). And with *GDP* negatively affecting variations in the unemployment rate (ΔU), one might conclude that indirectly a declining working age population (*WAP*) and an increasing old dependency ratio (*Old*) induce positive variations in the unemployment rate (ΔU).

The independent variable regarding net migration is significant for all periods considering all countries in the sample, with the negative sign of the coefficient implying that an increase in the influx of immigrants (compared to the outflow of emigrants) leads to a decrease in the unemployment rate. More specifically, an increase of 100,000 net migrants leads to a decrease of 0.087 p.p. in the unemployment rate which signifies that to achieve a 1 p.p. decrease in the unemployment rate, it would take a positive variation of 1,149,425 net migrants. The beneficial impact of immigration for the unemployment rate is reinforced if we consider the period ranging only from 1990 to 2020. In that case, a variation of 100,000 net migrants induces a decrease in the unemployment rate of 0.121 p.p., which means that for a decrease of 1 p.p. in the unemployment rate, it would take a variation of just 826,446 net migrants to achieve so.

These constitute striking results as they contradict what seems to be the general idea regarding immigration as an unemployment raising policy measure. This demystification of immigration as raising unemployment might be explained by how one perceives economic activity, if from a static or a dynamic perspective. If one looks at the economy from a static perspective, then it is natural to perceive immigration as raising

unemployment, given that from that point of view the number of jobs available in the economy is fixed which means that with more people (immigrants) vying for jobs, the unemployment rate must necessarily rise. But the fact is that economies are not static but dynamic. And an influx of immigrants, as suggested by the estimation of equation (2), has a positive impact in aggregate demand, generating more income which in turn generates more demand which in turn generates more supply which in turn generates more jobs. What the estimations of equations (2) and (3) suggest is that the creation of jobs induced by immigration surpasses the increase in demand for jobs derived from those same immigrants, thus positively impacting the labour market.

4.4 – LOW AND STICKY INTEREST RATES

What differentiates secular stagnation from mere slow growth resides on the ineffectiveness of monetary policy due to historically low and sticky interest rates – the zero lower bond problem. By looking at figure 1, the lowering of nominal short-term interest rates seems undisputable, passing from near 14% in 1982 to negative values in 2019 for the EU15 and from around 10% to near 2% for the US. We claim that this lowering of the nominal short term interest rate is due to secular stagnation headwinds present in the economy, thus deeming the zero lower bond problem endogenous to secular stagnation. Accordingly, we test this endogeneity by estimating equation (4) with the independent variables used to explain secular stagnation from a supply and a demand side perspective, in equations (1) and (2) respectively. The results of this estimation are presented in table 4.

Table 4 – Results of nominal short term interest rate

	All countries		EU-15		From 1990		From 2008	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WAP	0.313	0.352	0.336	0.349	3.085	3.412	0.168	-4.315***
	(1.990)	(2.001)	(2.148)	(2.124)	(2.458)	(2.769)	(0.553)	(0.972)
HC	-0.094***	-0.098***	-0.088***	-0.099***	-0.107***	-0.125***	-0.055***	0.001
	(0.024)	(0.025)	(0.027)	(0.028)	(0.030)	(0.035)	(0.016)	(0.002)
NFCF	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PAT	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TFP	-0.001	-0.001	-0.001	-0.001	-0.001	-0.000	-0.000**	-0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.000)	(0.000)
Young	0.408	0.437	0.440	0.468	1.609	1.866	-0.173	-1.867***
	(0.801)	(0.810)	(0.871)	(0.867)	(1.012)	(1.155)	(0.265)	(0.419)
Old	-0.140	-0.117	-0.103	-0.083	0.910	0.979	0.077	-1.928***
	(0.813)	(0.810)	(0.877)	(0.864)	(1.145)	(1.262)	(0.229)	(0.423)
GINI	0.107	0.117	0.097	0.105	0.179	0.181	-0.006	-0.038
	(0.114)	(0.113)	(0.112)	(0.110)	(0.126)	(0.129)	(0.030)	(0.051)
NetMig		0.001		0.002**		0.002***		-0.000
		(0.001)		(0.001)		(0.001)		(0.000)
Observations	554	522	515	485	415	383	166	134
R-squared	0.890	0.886	0.897	0.893	0.848	0.853	0.768	0.338

Note: Robust standard errors clustered at the country level are reported in parenthesis. Constant term and country and time effects estimated but omitted for reasons of parsimony. *, **, *** denote significance at 10, 5 and 1% levels.

Net migration is now significant in explaining the lowering of the nominal short term interest rate for the period considered when excluding the US from the sample, contrary to what happened regarding the estimation of equation (3) where net migration was only significant when including the US economy. But from 1990 on, this explaining variable is significant considering all countries in the sample. By positively impacting the nominal short term interest rates, a rise in net migration signifies increasing the nominal short term interest rate and being the lowering of interest rates a fundamental feature of secular stagnation, immigration appears also for this feature as a plausible solution. For the period ranging from 1990 to 2020, considering all countries in the sample, a variation of 100,000 in net migration leads to a 0.2 p.p. increase in the nominal short term interest rate. This means that a net influx of 500,000 immigrants would have the impact of raising the nominal short term interest rate by 1 p.p.

5 – CONCLUSIONS AND POLICY IMPLICATIONS

There are several factors among developed economies that prevent a natural and healthy process of economic growth. The set of these factors and its consequences came to be known as secular stagnation. The way usually found to cope with this stagnation has been through expansionary monetary policy. But the repeated manipulation of interest rates in a time where the factors for secular stagnation aggravate leads to a process of a continuous and gradual lowering of interest rates that renders monetary policy ineffective.

Not only the repeated use of monetary policy within the context of secular stagnation leads to its own ineffectiveness but it also turns economic growth in these economies dependent of debt, making them more susceptible to financial instability and more prone to financial crises. Given this ineffectiveness and unsustainability, it becomes urgent to rethink the full employment policy framework in times of secular stagnation. Because we theoretically derived the cited ineffectiveness and unsustainability from the temporal inadequacy of employing policy measures conceived to deal with temporary shocks in a context of a long-lasting event, we rule out from this imperative rethinking monetary and fiscal policy. Instead, we focus on policy measures that aim at eliminating or at least mitigating the factors causing such stagnation. And if there is an impactful and transversal factor that is demographics, as empirically evidenced. And if a declining working age population and an aging population are fundamental factors for secular stagnation then immigration must inevitably be considered a plausible solution in this imperative rethinking of a policy framework.

This logical inference is corroborated by our empirical analysis which shows that the influx of immigrants positively impacts aggregate demand, contributes to diminish the unemployment rate and leads to increases in the nominal short term interest rate, benefitting three of the four pillars of secular stagnation and, thus, proving to be a pertinent policy measure within such macroeconomic context.

Given then the relevance of immigration as a possible solution in times of secular stagnation, it becomes pertinent to assess how this translates into the current policy framework of developed economies. Based on the estimation results of equations (2), (3) and (4), we are able to determine the required net migration levels for each country entering our sample, in order to beneficially impact the output gap per capita, the unemployment rate and nominal short term interest rate by 1 p.p.. In table 5, we compare those required levels of net migration with the actual levels of net migration registered for those countries.

Table 5 – Recommended and actual net migration quotas in a policy framework context

	Required NetMig to increase GAP by 1 p.p.	Required NetMig to decrease U by 1 p.p.	Required NetMig to increase i by 1 p.p.*	Average annual NetMig	
Austria	64,565	222,041	95,787	27,617	0.35%
Belgium	83,486	287,111	123,419	26,495	0.26%
Denmark	42,914	147,582	63,355	10,389	0.20%
Finland	41,095	141,326	61,382	5,575	0.11%
Ireland	30,350	104,375	48,043	6,591	0.18%
Italy	465,648	1,601,374	680,242	99,094	0.17%
Luxembourg	3,404	11,705	5,475	4,532	1.09%
Netherlands	123,016	423,054	188,656	24,453	0.16%
Portugal	80,930	278,321	120,605	1,829	0.02%
Spain	325,607	1,119,770	502,454	114,855	0.29%
Sweden	71,195	244,843	106,725	26,856	0.31%
UK	479,604	1,649,368	709,699	124,524	0.21%
US	2,324,312	7,993,365	3,465,967	908,798	0.32%
Greece	82,866	284,978	126,351	14,012	0.14%
Germany	655,624	2,254,707	955,735	226,543	0.28%
France	480,473	1,652,359	730,310	74,704	0.13%

* Considers the period ranging from 1990 to 2020 given it is the period from which net migration is significant for EU15 and the US
Source: WDI.

Looking at table 5, only Luxembourg has an annual average immigration quota susceptible of increasing output gap by 1 p.p. but still insufficient to impact the unemployment rate and the nominal short term interest rate in the same manner. All the other countries in the sample though fail to meet the necessary immigration quotas to increase the output gap, to decrease the unemployment rate and to increase the nominal short term interest rate by 1 p.p.. This suggests that the level of net migration registered for these developed economies is insufficient to significantly impact those features and/or the current immigrant accommodation policies are not capable nor even designed to extract the full economic potential of immigration, revealing in this way how immigration is looked at in today's developed economies: as a problem rather than a solution.

It is important to stress that our study does not assess immigration qualitatively but only quantitatively. By utilizing net migration data instead of only immigration (given its unavailability) it does not clarify if the impact of net migration is due to an increase in immigration or a decrease in emigration. It does not characterize the type of immigration in terms of qualifications, gender or age groups and its impact on the impact of net migration. It does not look into the migration policies currently in place in developed economies and their suitability to enhance or to repress the impact of net migration. In fact, our paper does not provide, nor does it intend to, a definite answer regarding immigration in a context of secular stagnation, it only changes the question. Instead of asking "How do we deal with the immigration crises?" we should be asking "How do we take full advantage of the immigration opportunities?"

As a concluding remark, we leave a note of warning regarding the current context of the coronavirus pandemic crisis. It was initially stated that the irrelevance at which Hansen (1939)'s first predictions of secular stagnation were voted in did not mean Alvin Hansen was wrong but only that the world drastically changed afterwards, namely with the second world war and the consequent increase in public expenditure as well as the baby boom that followed in the US. Well, today we are facing probably the closest proxy of a world war without being an actual war, with the COVID pandemic crisis. Already in motion seems to be an unprecedented frontload of expansionary fiscal policy in Europe and in the US. It is important to not be anesthetized by the effects of this expected expansionary fiscal policy that aims to fight the temporary shock of the pandemic crisis and should not be misconceived as a solution for the problematic of secular stagnation. The incumbent numbness shall be resisted in avoiding the inertia to not do what needs to be done regarding structural policy measures. So, we close as it (re)began, with the words of Lawrence H. Summers: "*It is certainly possible that some major exogenous event will occur that raises spending or lowers saving in a way that raises the FERIR in the industrial world and renders the concerns I have expressed irrelevant. Short of war, it is not obvious what such events might be"* Summers (2014).

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APPENDIX

Table A – Summary Statistics

Variable	Mean	Std. Dev.	Min	Max	Obs.
PotGDP	10.4	0.95	8.539	13.019	896
WAP	0.654	0.023	0.58	0.701	896
HC	2.866	0.477	1.345	3.774	880
NFCF	3949.716	6571.379	-1086.463	38655.527	896
PAT	232.026	179.387	5.389	914.491	595
TFP	84.585	16.572	32	126.8	896
NetMig	1.060	2.488	-1.394	17.720	848
GAP	-0.003	0.028	-0.162	0.096	896
Young	0.306	0.073	0.202	0.531	896
Old	0.225	0.047	0.118	0.366	896
GINI	0.446	0.046	0.343	0.589	670
ΔU	0.097	1.084	-3.3	6.6	880
U	0.068	0.044	0.002	0.275	880
ΔEmpl	0.145	1.219	-5.812	15.16	880
GDP	10.396	0.952	8.502	13.012	896
Δg.AgWAP	31.851	14.265	0	41.688	880
i	0.06	0.051	-0.005	0.246	804

Table B – Correlation matrix

Variables	*PotGDP*	*WAP*	*HC*	*NFCF*	*PAT*	*TFP*	*NetMig*	*GAP*	*Young*
PotGDP	1								
WAP	0.181	1							
HC	0.544	0.29	1						
NFCF	0.8	-0.065	0.189	1					
PAT	0.303	-0.022	0.667	0.169	1				
TFP	0.24	0.509	0.408	-0.015	-0.161	1			
NetMig	0.041	0.088	0.425	-0.095	0.506	0.095	1		
GAP	0.032	0.059	0.029	0.102	0.035	0.075	0.104	1	
Young	-0.352	-0.755	-0.521	-0.061	0.016	-0.78	-0.05	0.047	1
Old	0.325	0.009	0.481	0.163	-0.003	0.602	-0.033	-0.141	-0.661
GINI	-0.325	0.011	0.061	-0.354	0.119	0.272	0.53	0.078	0.014
ΔU	-0.038	-0.042	-0.101	-0.039	-0.035	-0.124	-0.107	-0.392	0.096
U	-0.099	0.128	0.101	-0.196	-0.273	0.304	0.01	-0.316	-0.29
ΔEmpl	0.099	0.165	0.181	0.069	-0.02	0.222	0.09	0.447	-0.2
GDP	1	0.183	0.544	0.801	0.304	0.241	0.044	0.062	-0.35
Δg.AgWAP	-0.016	0.018	-0.002	0.028	0.069	-0.035	0.044	0.413	0.054
i	-0.273	-0.114	-0.492	-0.033	-0.159	-0.45	-0.155	0.132	0.424

Variables	*Old*	*GINI*	*ΔU*	*U*	*ΔEmpl*	*GDP*	*Δg.AgWAP*	*i*
Old	1							
GINI	-0.037	1						
ΔU	-0.096	-0.089	1					
U	0.301	0.047	-0.146	1				
ΔEmpl	0.117	0.111	-0.652	0.075	1			
GDP	0.32	-0.323	-0.05	-0.109	0.112	1		
Δg.AgWAP	-0.101	0.052	-0.503	-0.004	0.431	-0.003	1	
i	-0.504	-0.18	0.162	-0.078	-0.191	-0.268	-0.021	1

Table C – Pesaran's panel unit root, with trend

	Levels	First-Differences
PotGDP	-2.548	-2.86***
WAP	-4.659***	-4.659***
HC	-2.629*	-2.629*
NFCF	-2.081	-4.853****
PAT	3.37	-6.712***
TFP	-1.891	-4.378***
NetMig	-2.758**	-2.758**
GAP	-4.046***	-4.046***
Young	-4.886***	-4.886***
Old	-4.506***	-4.506***
GINI	0.095	-9.931***
ΔU	-4.349***	-4.349***
U	-2.869***	-2.869***
ΔEmpl	-3.968***	-3.968***
GDP	-2.611	-4.411***
Δg.AgWAP	-4.947***	-4.947***
i	-7.745***	-7.745***

Note: *, **, *** denote significance at 10, 5 and 1% levels.