Rare earth metals and sovereign wealth in Portugal: A basis for preserving common wealth and establishing Unconditional Basic Income

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ABSTRACT New natural assets such as lithium discovered in Portugal have the potential to supplement the financing of an Unconditional Basic Income (UBI) and a Sovereign Wealth Fund (SWF). Rare earth metals can provide both windfall profits, as well as ecological devastation, for both current and future generations of citizens depending on how the resource is managed. Apart from lithium, many other natural and social assets that can be partially converted into public goods such as a UBI are considered here. UBI paid at a high level is affordable and feasible in Portugal, without cuts to social services or contributory social insurance programmes. Paired with a SWF to benefit future citizens and invest locally, distributive justice can be optimally achieved.
KEYWORDS Basic income; Unconditional Basic Income; universal income floor; sovereign wealth; finance; public resource management.

RESUMO Novos activos naturais, como o lítio descoberto em Portugal, têm o potencial de complementar o financiamento de um Rendimento Básico Incondicional (RBI) e de um Fundo de Riqueza Soberana (FSR). Os metais de terras raras podem proporcionar tanto lucros inesperados como devastação ecológica, tanto para as gerações actuais como futuras de cidadãos, dependendo da forma como o recurso é gerido. Para além do lítio, são aqui considerados muitos outros bens naturais e sociais que podem ser parcialmente convertidos em bens públicos, como um RBI. O RBI pago a um nível elevado é acessível e viável em Portugal, sem cortes nos serviços sociais ou nos programas contributivos de segurança social. Em conjunto com um fundo soberano para beneficiar os futuros cidadãos e investir localmente, a justiça distributiva pode ser alcançada de forma óptima.
PALAVRAS-CHAVE Rendimento básico; Rendimento Básico Incondicional; piso universal de rendimento; riqueza soberana; finanças; gestão de recursos públicos.

1 Definitions

The UBIEXP research group at the Centre for Ethics, Politics and Society (University of Minho) and the Portuguese Basic Income Association refers to UBI as *Unconditional Basic Income*, as in a basic income that is free from obligations. No conditions or obligation to submit regular activity reports to bureaucrats, participate in the labour market, provide assets disclosure or meet many other arbitrary rules to receive this minimum income are required. In other contexts, sometimes UBI is referred to as Universal Basic Income. "Universal" generally means a basic income paid to all adults, while "unconditional" does not necessarily mean this. The latter form of UBI can be more synonymous with the idea of a Guaranteed Minimum Income (GMI) or a *universal income floor*. Therefore, the terms Basic Income (BI) and UBI, as well as GMI are used carefully and with full awareness of their differences throughout this article.

In Pereira (2017) these distinctions are elaborated upon further and it is shown how different versions of BI can be "calibrated" to produce the same final net cost. When comparing BI to universal health care systems internationally, one can see that these health systems are universal despite many citizens not using this public service for years at a time. It is universal because it is there for all in their time of need, whenever that time may arise. Similarly, a BI, UBI (Unconditional), UBI (Universal) and GMI are all equally universal, in that each guarantees all citizens a universal income floor. No one can fall beneath this income floor. It is thus a mistake to place too much emphasis on the "universal" term in some UBI proposals, because it is not doing any better at guaranteeing a sufficient income floor for all – in fact the universal version (also called a demogrant) often does worse by providing a lower amount as a universal minimum income.

2 Lithium, externalities and trade-offs

Portugal has Europe's largest known lithium reserves at more than 60,000 MT (metric tonnes) and is viewed as central to securing Europe's electric vehicle (EV) battery value chain (Gonçalves, 2023; Luckman, 2022). Economically significant by-products of such mining activity include feldspar and quartz. While Savannah Resources highlights the positive economic impact of mining expansion as one of the leading companies currently seeking further development in Portugal (Jamasmie, 2023; Savannah Resources,

2023), among local residents' concerns are large mining dumps, redirected rivers and negative agricultural and economic impacts: "We've been involved in sustainable farming for centuries… [we are] family-run businesses, keeping afloat without much help from the state." (Luckman, 2022)

Preserving common wealth and establishing long-term financial security for Portuguese citizens are symbiotic goals. Ecological assets such as clean water and productive rivers, as well as food security imperatives that reduce import dependence and maintain quality local production networks, are to be measured against the long-term externalities that may be posed by mining development. Once the mined resource has been depleted, what will remain for citizens, and what will have been lost in terms of other economic, social, ecological and heritage assets? It is estimated that the Barroso Lithium Project and opencast mine proposal would have a 14-year operational life, while producing lithium for 500,000 electric car batteries a year. Common land is also a feature of the dispute over plans for the new mine, in an "unspoilt region which has UN Food and Agricultural Heritage status for its landscape and farming traditions." (Bayley, 2023) The good news is that lithium development is not essential to creating a high-level UBI in Portugal as explained herein.

3 Introduction

Basic income (BI) advocates, as well as critics, tend to make the same error in assuming a national BI costs much more than it actually does. The source of this error is generally two-fold. In the first instance, one will look at the gross cost and find an astronomical figure by simply calculating the population by the level of BI each individual is to receive. In the second instance, if looking beyond the gross cost, analysts will only consider very limited financing options, such as increasing personal income taxes, VAT and possibly replacement of some redundant welfare programmes.

There are many more public financing options available, as well as many more redundancies (natural redundancies), to bring down the gross cost of BI to a very low net cost. The net cost can even be made to reach a cost-neutral figure, or a negative net cost (meaning that personal income taxes could even be reduced while introducing a BI).

How can this be done? And how can Portugal afford an unconditional basic income (UBI)? First, let us be clear about *natural redundancies*. Unlike

UBI proposals such as Charles Murray's (2016), which seek to eliminate most or all public programmes to finance a UBI, what I am referring to in this paper is solely those redundancies that occur as a result of introducing UBI. Natural redundancies of public programmes are those programmes that are no longer required because a UBI provides a superior or equal alternative.

Therefore, universal public healthcare systems, public education and many other government programmes remain intact. While these remain untouched, others such as bureaucratic and stigmatizing welfare payment expenditures become obsolete. The expensive bureaucracy that goes along with it, which is required to oppress and punish the poor for pursuing education, by monitoring their day-to-day living arrangements, micromanaging their employment situation, etc. also becomes redundant. Some programmes thus become fully redundant, others partially so and many others remain as is.

In fact, the elimination of poverty via a UBI actually reduces hospitalizations and negative public health outcomes (Forget, 2011; Hamilton Health Sciences, 2022), leading to much better functioning health systems and increased capacity. That is just one example of how UBI improves existing public programmes and begins to pay for itself, which we will return to later.

4 How we can afford it.

The redundancies, or replacement cost of many existing government programmes, goes a long way in paying for UBI as a first step. These natural redundancies are also much more numerous than is commonly cited in the literature.

Details of these overlooked natural redundancies of government programmes and expenditures that would result from UBI being implemented in several countries are found in Pereira (2017). Boadway et al. (2019) demonstrate a revenue-neutral basic income guarantee that is accomplished by replacing refundable and non-refundable tax credits, while "all social services and contributory social insurance programs remain intact." They do so for Canada at a high level of basic income guarantee of $20,000 per adult adjusted for family size, in a manner that is transferable to many liberal democracies with similarly complex tax codes and benefits regimes. Pereira (2017) likewise does not propose any cuts to contributory social insurance programmes like unemployment insurance or

contributory public pension schemes, nor any cuts to social services in health provision, education, disability services, legal aid and more.

We know that the current system, the status quo, is expensive. It is socially as well as financially unsustainable given all the unnecessary complexity, negative health outcomes and persistently high poverty rates it maintains. It contains many programmes that often work at cross-purposes to each other. Deepening inequality and insecurity in recent decades have been its hallmark. This is what is too expensive. "The cost of administering all this complexity is staggering… to issue one twenty-five-cent bus ticket, in terms of time and energy, cost the welfare system about four dollars!" as stated in early calls for a UBI in the 1970s (Croll Report, 1971, p. 87). The complexity has multiplied since then.[1] It is better and much less expensive to give this money directly to people in the form of UBI without bureaucracies consuming the majority of these resources.

Applying these analyses found in Pereira (2017), Boadway et al. (2019) and cost of poverty studies to the case of Portugal can provide a comprehensive picture of natural redundancies of government expenditures that go a long way toward financing basic income. That is step one. I will provide a partial list of additional *direct* finance options (Table 1.1) that Portugal could employ to afford UBI and some *indirect* finance options (Table 1.2), as step two. This is followed by expanding upon each option with a brief rationale and some research details in point form:

Table 1.1 Additional UBI financing options for Portugal

Sovereign Wealth Funds	Electro-magnetic (EM) spectrum rents
Financial Transaction Taxes	Patent and copyright royalties
Wage subsidy programme costs	Pricing externalities (ecol. and social)
Unearned income tax rates	Corporate Income Tax (CIT) rates
Carbon fee and dividend	Offshore tax haven losses
Hawaii UBI proposal as model	Luxury taxes
Automation / Robot Tax	Additional direct tax revenue generation with UBI supporting consumer spending
Elimination of corporate subsidies	Solar dividends (renewable energy, and public utility dividends)
Technology and data dividend	

1 See Steensland (2008) for more and detailed examples of overwhelming complexity in welfare systems.

While public costs associated with legislated poverty represent real expenditures of public finance, some may view these public funds as not immediately available to initiate a UBI programme. Others view the direct link with the cost of poverty, hospitalization rates due to income insecurity and associated precarious housing, homelessness, etc. as costs to be immediately recouped by governments with implementation of a sufficient UBI. A very short term "bridge loan" in finance can close this conceptual gap *if needed*, preventing these wasteful expenditures in subsequent years. However, what is presented in this article are a surplus of options for financing basic income that do not rely on each of these direct or indirect finance options, rather a select few can be chosen to achieve a politically feasible solution.

Table 1.2 Indirect UBI financing options for Portugal

Cost of poverty findings	Job creation and retraining programmes, replacement costs (evidence of wasteful spending on these)
Hospitalization reduction rates of 8.5% (Forget, 2011)	Multiplier effect
Homelessness, precarious housing linked to high rates of traumatic brain injury – public cost reduction available from housing security provided by UBI	Shorter work time / full employment policies
Crime reduction	Public Interest Ownership – Kiwibank, state-owned bank model (New Zealand)

i. Sovereign Wealth Funds (SWFs) – modelled on Norway, Alaska and Singapore's SWFs, Portugal could initiate several SWFs to collect the economic rents from natural resource and other sectors of the economy. This can be saved for current and future generations, as well as pay out a UBI as in the case of Alaska. Singapore's SWFs are based on land values (Haila, 2016). Australia has one non-commodity SWF and one based on mineral wealth (Cummine, 2016). Wyoming (US) has one based on minerals. Portugal is about to experience a boom in lithium mining, which would be better stopped or at least minimized to prevent ecological harm, but if it is to proceed Portuguese citizens ought to be the primary beneficiaries (as Norwegians are with their oil wealth and SWF). Best practices from dozens of SWF models can be combined.

ii. Financial Transaction Taxes (FTTs) of various types on high frequency and volume trading of stocks, bonds, derivatives and other financial instruments. This is an exceptionally small tax applied to mostly institutional trading by large firms, generating large-scale revenues due to the volume of trading, particularly in a hyper-financialized modern economic system. Variations of this Tobin Tax can be applied to different financial markets at the national level.

iii. Wage subsidy programme costs can be transferred to financing basic income instead. There are commonly multiple such programmes in each OECD country (sometimes called active labour market policies), with many new ones introduced in response to the COVID pandemic. Sometimes they are in the form of tax credits. These also carry more overhead or bureaucracy costs than financing UBI or a guaranteed minimum income.

iv. Unearned income tax rates can be raised to equal earned income tax rates. Unearned income could be taxed at higher rates than earned income, especially activity that could be deemed socially harmful, such as speculation that increases living costs (housing, rent, land and other prices).

v. Cost of Poverty studies indicate a high public cost that can be eliminated in countries such as Portugal or Canada with a sufficient guaranteed income floor. In Canada, a 2008 study calculated $72-86 billion annually as the cost of poverty (Laurie, 2008; Rainer & Ernst 2014). Transferring this analysis to Portugal will likely yield a similar or higher result proportional to population, given similar poverty rates in both countries (OECD 2022). Inflation has also driven up this cost since 2008.

vi. Hospitalizations reduced by 8.5% (Forget, 2011) - findings from guaranteed annual income experiments studied by Evelyn Forget. Health care costs are rising quickly as the largest share of many national and state budgets.

vii.Carbon fee and dividend – carbon pricing could be returned 100% to Portuguese citizens as modelled by Hansen (2009) and Jaccard & Associates Enviroeconomics (2008) for the U.S. and Canada respectively. $3,000 per year for each adult American in 2007 was calculated by this model. It could also be modified to be more progressive, with higher payouts to lower income citizens (and possibly capping payouts to those earning €60,000 or less annually), since lower income groups also tend to be more exposed to environmental pollution and poor air quality. The

Climate Action Incentive Payments ensure *8 out of 10 families receive more money back than they pay in direct costs* under this carbon pollution pricing system enacted by the Government of Canada.

viii. Hawaii has a proposal for UBI based on tourism levies and capturing the full value of fishing licenses for the benefit of its residents, supported by Hawaii State Representative Chris Lee (Wilkins, 2017). The economy is similar to Portugal's in several respects.

ix. Automation / Robot Tax – Hawaii is also considering this in its UBI proposal. William Meisel has detailed proposals on this and Bill Gates is a proponent (Porter, 2019).

x. Elimination of corporate subsidies – various forms, to be quantified for Portugal.

xi. Technology and data dividend – while the automation / robot tax is aimed at mitigating or capturing the cost of job displacement and redirecting these funds towards UBI, the technology and data dividend was popularized by Andrew Yang as a "tech check" to be paid to all citizens from the profits gained by the tech sector in relation to its usage of personal data, advertising revenues and other profits gained from the internet as a public resource. This public resource was largely created by public investment decades ago. The technology sector is bigger than the oil industry now, and could pay out bigger dividends than could be supported by SWFs like those in Alaska, Norway and elsewhere. There is also a *technological inheritance* or technology commons feature to this; technology being built by each generation adding to the previous one's innovations in a cumulative fashion.[2]

xii. Electro-magnetic (EM) spectrum rents. Barnes (2001) covers this topic in *Who Owns the Sky?: Our Common Assets and the Future of Capitalism*. The same analysis can be applied to Portugal by quantifying the economic rents derived from broadcast spectrum licences, auctions and ongoing revenues. Flomenhoft (2017) has some financing options quantified for Australia on EM spectrum, technology and related rents for UBI.

xiii. Patent and copyright royalties – these economic rents are mostly foregone revenues by the state, given excessive monopoly

2 Inventive geniuses such as Nikola Tesla and many others have provided technology and platforms globally for infinite future developments, whose benefits (and profits) ought to be shared rather than privatized for exclusive private profit. The role of public education, universities, public research grants and other infrastructure and government investment requires a large-scale rebalancing of the economic rents in the tech sector due to society in contrast to excessive current private gains.

patent protection offered in various economic spheres including pharmaceuticals. The research and development of universities and public education, public grants, etc. is undervalued with most of the gains going to private and multinational corporate profits. A rebalancing can occur of this revenue sharing between public and private sectors in Portugal as in other countries.

xiv. Pricing externalities (ecological and social) – in addition to carbon pricing outlined above in the form of carbon fee and dividend, other levies are available to mitigate social and ecological harm while returning revenue generated to citizens or eliminating these publicly-borne costs. Increased workplace stress and unpaid overtime work costs more than $30 billion per year in Canada (MacQueen, 2007; Pereira, 2009) with these findings transferrable to Portugal upon research of comparable national data and statistics.

xv. Corporate Income Tax (CIT) rates can be increased. They have been reduced excessively[3] and can be made progressive in comparison to the personal income tax rate structure.

xvi. Offshore tax haven losses to the public treasury must be addressed, with regained losses financing public goods such as health, education and BI.

xvii. Homelessness and precarious housing are associated with very high rates of traumatic brain injury (Hamilton Health Sciences 2022). Public cost reduction is available from the housing security provided by UBI.

xviii. Crime reduction - In the Namibia basic income pilot, overall crime went down by 42%, and in Canada's Manitoba pilot it went down by 15%. (Calnitsky, 2021; Santens, 2022)

xix. Job creation and retraining programme costs would be better directed to UBI given evidence of wasteful spending on these programmes. Andrew Yang as presidential candidate for the U.S. in the Democratic Party primaries had a previous career in such job creation initiatives and grants, abandoning it as a wasteful exercise and adopting UBI as a superior public policy to support nationally. He provides data in his book and other sources for this position (Schleifer, 2019).

xx. Luxury taxes are another financing option, with useful precedents in other jurisdictions.

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3 "Since 1990, the pool of global financial capital has tripled and is expected to reach a quadrillion dollars by 2020." From Toby Sanger, "The world is awash in excess cash," *The Globe and Mail*, Mar 11, 2014.

xxi. Additional direct tax revenue generation with UBI supporting consumer spending, especially on basic needs and in the local economy (see Pereira, 2017 for sizable and usually unaccounted figures in BI cost analyses).

xxii. Multiplier effect – in addition to the additional direct tax revenue generation item above, UBI will create jobs with this increased direct consumer spending, and those new jobs will support additional economic activity (CANCEA, 2020). The Canadian Centre for Economic Analysis (CANCEA) found basic income could grow Canada's economy by $80 billion a year and create nearly 600,000 jobs in 5 years.[4] This data is highly transferable to Portugal accounting for population differentials.

xxiii. Shorter work time policies (see Pereira, 2009) with full employment as a goal, will reduce the number of people who require guaranteed minimum income or BI, thereby further reducing the cost of the programme.

xxiv. Solar Dividends: *How Solar Energy Can Generate a Basic Income for Everyone on Earth* is the title of a book by Robert Stayton (2019) who models a UBI in America based solely on solar power revenue generation. His analysis can be extended to other forms of renewable energy, and public utilities to increase the UBI according to Pereira. Portugal offers significant solar capacity, as well as other renewables and modern utilities than can be aligned with this model to provide universal dividends to its citizens, forming a key ingredient of a UBI.

xxv. Public Interest Ownership – state-owned enterprise as a competitive option or alternative to private sector enterprise. Statoil in Norway, Kiwibank in New Zealand, Hydro Quebec and other successful state-owned enterprises provide revenue directly to governments for the provision of public goods, often with increased transparency and accountability to citizens (lower executive salaries and compensation packages than private sector corporations, fuller financial disclosure and absence of the use of offshore tax havens, etc.)

This is not a complete list of financing options.[5] In addition to the programme and tax credit redundancies previously discussed, this

4 Full report can be downloaded here: https://www.ubiworks.ca/groweconomy

5 One could analyse additional programmes such as tax shelters, tax incentives and deductions for charitable donations, etc., some of which are listed for Portugal by PWC (2021). Banking license fees are another worthy subject of investigation (detailed in Flomenhoft, 2017), as are other treatments of bank and finance profits (and rents) as found in New Zea-

is a long list from which to choose to augment the financing of UBI in Portugal. The state may only need to choose two or three of these options to achieve a UBI, recognizing that items such as savings from the cost of poverty occur automatically with introduction of UBI at a sufficient level. Public expenditures are reduced in this way, allowing those savings to be invested in UBI or GMI.

Notice also that in the list of financing options, personal income tax increases have not been included as an option. This is to demonstrate the variety of finance methods that exist for a basic income in Portugal. VAT also has been left out as an option. VAT and personal income taxes are often by default chosen as the only way to finance basic income, particularly in the European context (and even in the U.S. with Andrew Yang's campaign for the presidency).

A longer term project will be required to quantify many of these financing items for Portugal. However, comparable work has been done for other countries and jurisdictions in a manner that is very transferable to Portugal if one is allowed the time and resources to locate, delve into and extrapolate the country-specific data.

5 Comparative case studies and surplus financing for UBI

Similar costing exercises have been conducted in detail for other jurisdictions that show a surplus in financing as measured against the 'cost' of BI, and in other instances a cost-neutral financing model. In Pereira (2017) three countries are studied – Canada, Switzerland, Australia – with detailed proposals submitted for financing a BI in each. Other countries and jurisdictions are discussed comparatively in designing UBI and GMI proposals for these three countries, including Alaska, Vermont, the U.S., U.K. and Norway.

By analyzing four categories of financing for Canada, Pereira arrives at a savings figure of $464 billion by implementing a BI. Deducted from this amount is the cost of $21.5 billion for a BI in the form of a GMI, bringing all individuals and families up to the poverty level (i.e. reduction of poverty to zero). Contrasted with the GMI is the universal or demogrant option of paying all individuals age 18 and over a grant at

land with the Kiwi Bank model.

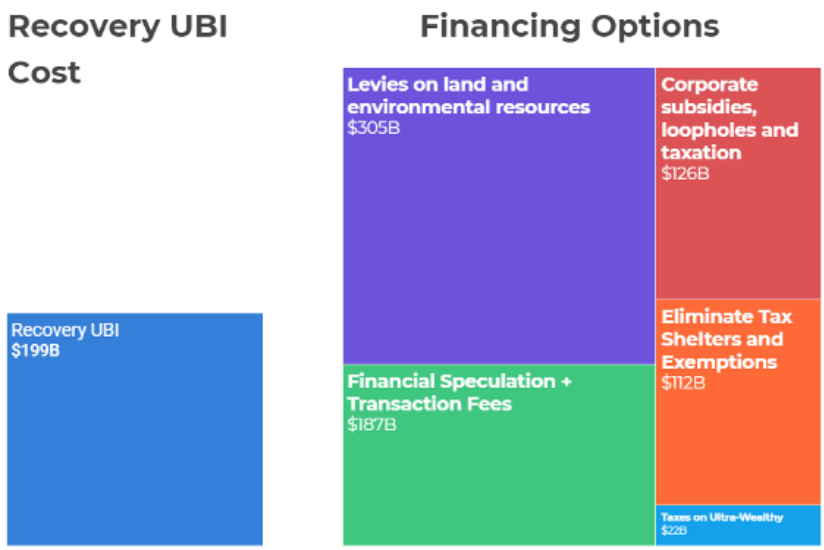
the poverty level amount plus a demogrant to each child at a approximately 30% of the amount of the adult demogrant. This latter option costs $418 billion. Both options result in a surplus in public finances.

Analyzing only "Savings from Replacement of Existing Income Security Programmes" from natural redundancies, Pereira (2017, pp. 34-7) arrives at a public savings total of $342 billion, measured against a cost of $21.5 billion for a BI (GMI) which eliminates official poverty. Over $300 billion in public finance surplus is obtained in this manner without employing any additional financing options.

It should also be noted that Pereira (2017) lists many financing options for basic income, but does not quantify all of them – some were beyond the scope of the work pursued. Nonetheless, one finds public financing surpluses available when designing different BI options at a high enough level to bring all Canadians up to the poverty line. And many of the financing options were costed in a conservative fashion, suggesting much more revenue is available to furnish UBI.

Similar research at UBI Works[6] provides this visual representation of the cost of a different BI proposal as measured against the financing available:

Figure 1.1 Cost versus financing options for UBI (Canada)



Source: UBI Works (2022).

6 Modelled on the approach in Pereira (2017), providing both a GMI and universal dividend (or UBI) to citizens.

Over $750 billion worth of tax reform ideas are presented against a cost of $199 billion for a hybrid basic income model (one component is a GMI, the second component is a universal dividend along the lines of the Alaska dividend, albeit at a higher level than the Alaska payment [and paid monthly instead of annually]). This figure does not include savings from replacement of existing government programmes (natural redundancies), that bring the financing options figure to over $800 billion.[7]

Boadway et al. (2019) demonstrate a revenue-neutral basic income guarantee for Canada that is accomplished by replacing refundable and non-refundable tax credits, while "all social services and contributory social insurance programs remain intact." They do so at a high level of basic income of $20,000 per adult adjusted for family size, in a manner that is transferable to many liberal democracies with similarly complex tax codes and benefits regimes.

These are generous models of BI in comparison to most, sufficient to eliminate poverty, while preserving all core public programmes such as universal health care and public education (and many more). And each is committed to the principle stated in the landmark Croll Report that a BI cannot leave any individual worse off. These are dramatic improvements upon the status quo income security model, while realizing many public cost-savings and generating additional revenue from financing options that do not rely on VAT or personal income tax increases.

Teixeira (2019) and Widerquist & Arndt (2020) model much smaller BI proposals for Portugal and the UK respectively. Teixeira considers one UBI of €200 per month and another set at €420 per month. This article is in agreement with Teixeira in that it rejects proposals such as Charles Murray's (Teixeira, 2019, p. 481) that seek reduction of state power at the expense of expanded private market power. The state has already been diminished during the neoliberal period with excessive privatizations, outsourcing and austerity policy. Teixeira (2019, pp. 482, 484, 485) also seeks elimination of redundant subsidies and social benefits, recognizing some of these will be fully replaced by UBI while others will be partial redundancies (partially replaced by UBI).

Widerquist and Arndt (2020, p. 6) choose a UBI for adults of £7,706 per person per year, which equals the poverty line for two adults living together (£15,413), but below the poverty line for one individual

7 UBI Works identifies $73.9 billion in additional savings/financing available from a select list of "Existing Government Program Changes" in an associated spreadsheet on their website. There are more such programmes and savings that they did not list or quantify.

living alone (£10,327). They also list a number of programme redundancies and identify others that are retained, the latter including: Carer's Allowance, Severe Disablement Allowance, Disability Living Allowance, Attendance Allowance, War Pensions, Industrial Injuries Disablement Allowance and others (Table 3: List of UK Social Security Programs). For children under 18 they set the UBI at £3,853.

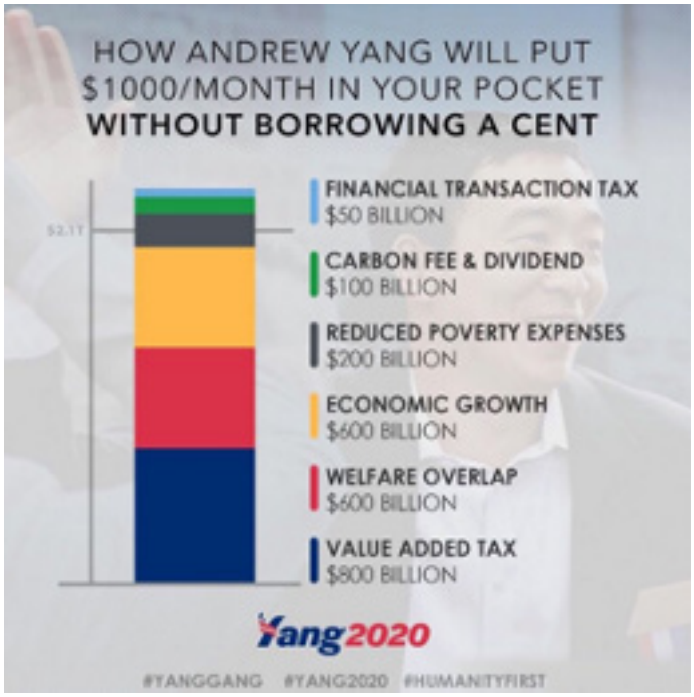
Similar to Pereira (2017), Widerquist and Arndt (2020, pp. 17-18) reject increases to VAT ("because of its regressive aspects") to make up the financing difference, as well as recommending against a "purely income-tax financed UBI". They propose instead resource and rent taxes, wealth taxes, and financial or technology taxes, however they provide no additional detail and highlight these as a "promising area for further research." After programme redundancies, they find a 3.4% of GDP cost remaining to finance UBI (£67 billion net cost).

One further and recent cost-neutral universal BI proposal is the Freedom Dividend, advocated by Andrew Yang in his campaign for the US presidency. Figure 1.2 provides a visual illustration of the six financing sources he selects, two of which are cost redundancies (welfare overlap and reduced poverty expenses) and a third being related to these two in the sense of being endogenous to UBI – additional public revenue generated by the universal dividend (economic growth). Thus, only three financing options are employed, drawing in revenue from external sources (financial transaction tax, carbon fee & dividend, VAT).

The VAT is a regressive tax that is not recommended in this research article, nor in the analyses of Boadway or Pereira. Granted, Yang has talked about making his VAT proposal progressive in some ways (such as applying it more progressively and at a higher rate on luxury products, with a lower rate or exemption applied to necessities), but he has not shown this in his Freedom Dividend financing proposals explicitly. Perhaps a small land value tax (LVT)[8] would be a more efficient and progressive taxation approach in place of VAT, as claimed in Pereira (2020). The luxury tax element of a VAT could be retained and combined with these other sources as a progressively structured fiscal measure.

8 LVC or land value capture is also a potent revenue generation instrument for the public sector where employed, and highly complementary to LVT. See Given & Reisman (2019).

Figure 1.2 Yang's cost-neutral universal BI proposal for the US



Source: Image from Andrew Yang's presidential campaign website, November 2019

Therefore, many alternative financing options have been presented and can be employed from this research to finance both a UBI or GMI, without the need to increase personal income taxes or VAT, and which can generate significant public financing surpluses. This is particularly easy to see with the much lower cost of a GMI. With the UBI or demogrant version, financing surpluses can still be achieved, and it should be noted that calibration can occur between the two models (GMI and UBI-demogrant) to arrive at the same or very similar net final cost (or surplus).

6 Conclusion: Enough and to spare for UBI and SWFs in Portugal

Over twenty-five new financing options have been presented in this article to establish a UBI in Portugal, and more than one sovereign wealth fund. This is in addition to multiple programme and tax credit redundancies. These finance options do not include VAT or personal income tax increases. Only two or three of these financing methods are required in addition to the cost redundancies that occur with imple-

mentation of UBI, particularly a decent UBI at a sufficient level to eliminate or virtually eliminate poverty. SWFs based on mineral wealth, land values, other natural resources, technology and data dividends can benefit future and current generations, support local investment, while also financing a UBI.

The return on investment exceeds the original investment in UBI (in both GMI and demogrant form), as the costs of the status quo system are so expensive, and because the UBI will generate additional direct taxation from the increased consumer spending it supports. The economic multiplier effect is to be considered in addition to these benefits of UBI (CANCEA, 2020; Pereira, 2017). And reaping the windfall profits from natural and social assets does not involve any investment, but rather capturing hitherto foregone economic rents on common assets to further supplement finance of UBI and SWFs.

The cost of poverty and associated negative health outcomes are remarkably high and unsustainable, that a UBI is required to replace the dysfunctional and inadequate current income support system. It is more expensive than UBI because it is a wasteful, complex system, requiring appeals tribunals and processes, monitoring and micro-management of people's lives, it keeps people in poverty traps and denies them the freedom to pursue further education and the work they desire, and even penalizes them for taking employment in the labour-market with excessive clawback rates in a manner not present with UBI. These factors have been largely unaccounted in most UBI research to date.

By pursuing the research avenues explored in this article, a financially sustainable UBI proposal for Portugal can be crafted. The finance options are numerous and often very large-scale in the revenue generated and public sector cost-savings available. All that remains is to continue this work, adding detail to several of these finance options, deepening the analysis of available programme cost-savings, and then narrowing it down to a few options to combine for the best proposal.

Preserving common wealth and establishing a UBI are both imperative and feasible in Portugal. Discovery and development of new public assets such as the EM spectrum, new technologies deriving income from the digital and data commons, or rare earth minerals represent sovereign wealth above and beyond what is required to finance basic income. There is enough and to spare for a universal income floor above the poverty line, as well as investment in SWFs to share the wealth with future generations.

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